

Nevada City

Energy Action Plan



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Produced by Sierra Business Council

Supported by Pacific Gas and Electric Company (PG&E)

In Collaboration with the City of Nevada City



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EXECUTIVE SUMMARY

The Nevada City Energy Action Plan (EAP) is a roadmap for expanding energy-efficiency and renewable-energy efforts already underway in the City. It builds upon energy-efficiency efforts begun in 2010 and work conducted by Sierra Business Council (SBC) from 2010-2015. The document focuses on three energy use sectors within the community – residential, non-residential and municipal (which is a subset of non-residential). The report only evaluates energy consumed by buildings and municipal operations; other energy consuming sectors such as transportation, solid waste, etc. are not addressed but could be at a future date. Nevada City owns/operates the City Hall, the City Yard, the Fire Station and Fire House, public parks, museums, water delivery, a water treatment plant, a wastewater treatment plant, streetlights and park lighting.

The two primary energy sources consumed by the three community sectors are electricity and natural gas which is distributed by Pacific Gas and Electric Company (PG&E). Additionally, there is potentially significant propane and other non-utility fuel use in Nevada City though due to data limitations this fuel use was not analyzed. According to the baseline inventory conducted for Year 2005, the community consumed 34 million kilowatt hours (kWhs) of electricity and 1.5 million therms of natural gas. Municipal operations in 2008 accounted for 1,103,759 kWhs of electricity consumption and cost the City \$164,630, while natural gas consumption reached 30,000 therms and cost the City \$37,415. The forecast for Year 2020 shows a 20% increase in residential energy consumption and an 11% increase in non-residential energy consumption if no additional energy efficiency actions are taken. To date the City's energy efficiency efforts are saving over 4.3 million kWhs of electricity and 32 thousand therms of natural gas annually, which underscores the importance of having such measures.¹ The inventory and forecast work conducted by SBC identifies additional areas where significant opportunities exist for additional energy savings. The EAP specifies the actions needed to achieve those savings resulting in further reductions in energy consumption and increased energy savings for residents, businesses and the local municipal government.

The City's total municipal electricity consumption of 1,103,759 kWh is 3% of the community's total electricity consumption (34,028,712 kWh), and the City's total natural gas consumption of 30,000 Therms is less than 2% of the community's total natural gas consumption (1,510,999 Therms). While the City has undertaken efforts to improve energy efficiency, there are still significant opportunities for the City to reduce energy usage and the associated costs, which are mentioned in the previous paragraph

The document is organized into five chapters; the 'heart' of the document is contained in Chapters 4 and 5 (Energy Efficiency Goals, Strategies and Actions, and Implementation). The goals address five key areas:

- Energy efficiency in existing structures
- Energy performance in new construction

¹ Nevada City residential and non-residential energy savings based on projects completed 2006-2012. Source: PG&E

- Expansion of renewable energy options
- Energy efficiency in municipal operations
- Water conservation which reduces energy needed to transport and treat water

The strategies focus on voluntary measures that can be taken by residents, businesses and the local government. Key components include developing and disseminating information on existing rebate and incentive programs; public outreach via the City's website and printed materials; training for staff, contractors and developers; and partnerships with PG&E and local and regional organizations. Energy reduction performance indicators and targets are established for each group of strategies. If all the actions are implemented, the EAP would reduce electrical energy used in 2020 by 28% and natural gas use by 10%. The estimated energy and cost savings for each strategy area would be as follows:

Summary of Potential 2020 Annual Energy and Cost Savings

Strategy Area	2020 Annual Energy Savings		2020 Annual Cost Savings	
	kWh	Therms	Electricity ²	Natural Gas ³
Existing Structures	3,062,584	135,990	\$ 776,671	\$ 475,965
New Construction	877,070	28,890	\$ 222,425	\$ 101,113
Renewable Energy	6,612,963	11,600	\$ 1,677,047	\$ 40,600
Municipal Operations	220,752	6,000	\$ 55,983	\$21,000
Water Conservation	21,436	--	\$ 5,436	--
Total	10,794,804	182,480	\$ 2,737,562	\$ 638,678

The following table compares 2005 Baseline energy usage, 2020 Business as Usual (BAU) usage and potential energy use savings in 2020 with the Energy Action Plan (EAP).

Comparison of 2005 Baseline and 2020 Forecasted Annual Energy Use with and without the EAP

Energy Use	2005 Baseline	2020 BAU without the EAP	2020 with the EAP	Percent Difference
Electricity	34,028,712 kWh	38,705,886 kWh	27,911,082 kWh (-10,794,804 kWh)	28% reduction from 2020 BAU
Natural Gas	1,510,999 therms	1,757,940 therms	1,575,460 therms (-182,480 therms)	10% reduction from 2020 BAU

Purpose of the Nevada City Energy Action Plan

The EAP can be used by local residents and business owners to see where they might achieve greater energy efficiency in their home or commercial building. The local municipal government can use it

²Assumed average rate of \$0.2536 per kWh based on Forecast of PG&E Rates.

<http://www.ci.healdsburg.ca.us/Modules/ShowDocument.aspx?documentid=8906>

³ Assumed average rate of \$3.5 per therm based on extrapolation from PG&E 2015 natural gas forecast.

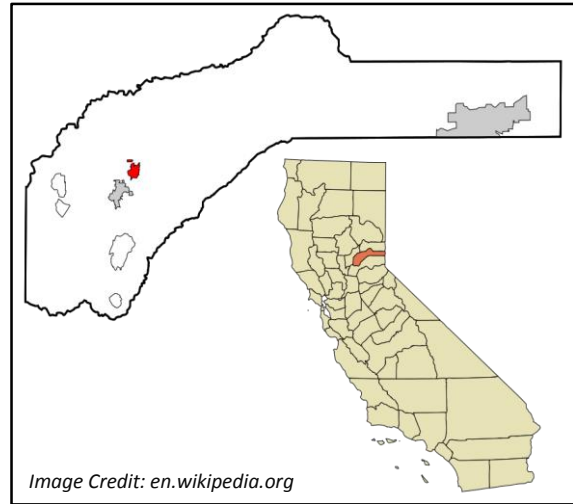
<http://www.pge.com/tariffs/rateinfo.shtml>

to guide decisions about how to make the City's building and operational infrastructure more energy efficient. It can also be used by City staff to prioritize programs to inform, encourage and inspire residents and businesses owners to be more energy efficient now and in the future. Exploring and implementing energy-efficiency programs creates flexibility for the City in meeting its energy demand. This in turn helps the community be more self-sufficient and economically resilient in light of probable future increases in energy prices, whether due to market conditions or the regulatory environment. Being energy efficient does not compromise the City's historic character or charm but rather enhances its ability to respond to the ever changing external conditions related to energy supply and demand.

CHAPTER 1: BACKGROUND

Community Profile

The City of Nevada City is a semi-rural and well-preserved Gold Rush town, first settled in 1849 and incorporated in 1856. It covers an area of 2.2 square miles in southwestern Nevada County, roughly 60 miles northeast of Sacramento. Highway 20 and Highway 49 transect and border the community, while Deer Creek flows through the City's center. In 2010 the City was home to approximately 3,068 residents living in 1,332 households with an average household size of 2.3. The City has a full-time staff of approximately 30 employees and an operating budget of \$3.2 million. Nevada City owns/operates the City Hall, the City Yard, a Fire Station, public parks, museums, water delivery, a water treatment plant, a wastewater treatment plant, streetlights, park lighting and other municipal facilities. Electricity and natural gas for the community is distributed by Pacific Gas and Electric Company (PG&E).



The climate in Nevada City reflects its location in the Sierra Nevada foothills. Average temperatures range from summer highs in the high 80 degrees Fahrenheit to winter lows in the mid 30's with record highs in the 110's and record lows in the low 20's.

Local Energy Efficiency Efforts

Nevada City has also been dedicated to reducing their carbon footprint and creating a more sustainable future for its residents. Summarized below are activities and programs the City has undertaken to promote that leadership position. For a full description of programs and activities, refer to Appendix D.

- Completion of Local Government Operations, and Community-wide Greenhouse Gas Emissions Inventories.
- Actions to reduce government operations emissions including a recent \$25,000 energy-retrofit grant award.
- Lead-by-example solar installations.
- Purchase of high-efficiency and electric fleet vehicles.
- Streamlining of solar permitting process.
- City-wide water conservation program.
- Commitment to increased walkability of city.

In addition, the 2014 update to the Housing Element of the City's General Plan supports energy efficiency in the following ways:

- Promoting energy conservation activities throughout the city (p. 6-13)
- Referring interested parties to the various rebate programs offered by PG&E (p. 6-13)
- Notifying City residents that energy conservation improvements are available for assistance under the City's residential rehabilitation program to income-based qualified households (p. 6-14)
- Amending the General Plan by incorporating new policies and/or programs that will address available energy saving measures into new construction projects (p. 6-14)

CHAPTER 2: INTRODUCTION

This chapter discusses the purpose and scope for the Nevada City Energy Action Plan (EAP), the regulatory context for energy efficiency planning, how the EAP was developed and provides a user's guide to the document.

WHY PREPARE AN ENERGY ACTION PLAN?



Photo Credit: David McKay

Local economies in the Sierra Nevada rely heavily on natural resources for tourism, recreation, forestry, agriculture and other industries. Changes in weather patterns resulting in less precipitation and significantly warmer temperatures have the potential to adversely affect the vitality of the region's natural resources, which in turn directly impacts local business. Reducing a community's demand on the energy grid helps lighten the need for new energy generating plants and creates the

flexibility for the community to more readily meet its energy needs with locally produced renewable energy. Retrofitting homes and businesses to be more efficient creates local jobs, reduces energy costs, improves air quality, and in combination with increased opportunities for walking and bicycling, improves community members' health. In addition, money not spent on energy can instead be spent at local businesses, improving the local economy.

The Nevada City EAP outlines a series of strategies to reduce energy consumption in residential and non-residential buildings as well as municipal facilities and operations. This plan is intended to provide guidance to City staff, demonstrate the City's commitment to energy efficiency and inspire residents and businesses to participate in community efforts to maximize energy efficiency and reduce the associated air quality impacts of fossil fuel based electricity.

Climate Science Basics

Naturally occurring gases ⁴ dispersed in the atmosphere determine the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect, which is a natural process that perpetuates life on earth by keeping the planet's surface warm. Scientific observation indicates that average air and ocean temperatures have steadily increased globally over the last 100 years. Evidence of this includes rapid levels of glacial melt, reductions in sea ice, shorter freezing seasons and decreases in snowpack.

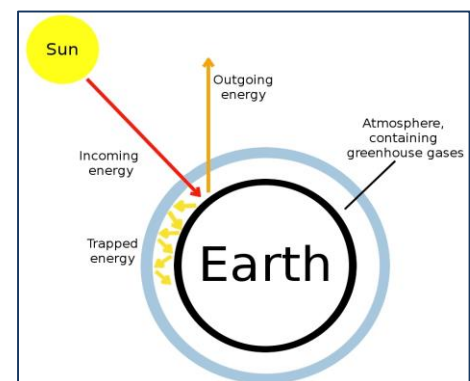


Image Credit: simpleclimate.wordpress.com

⁴ The primary greenhouse gas (GHG) in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide and ozone.

Scientific studies suggest that human activities are accelerating the concentration of greenhouse gases (GHGs), which affects the global climate. The most significant contributor is the burning of fossil fuels for transportation and electricity generation, which introduces large amounts of carbon dioxide and other GHGs into the atmosphere. Collectively, these gases intensify the natural greenhouse effect, causing global average surface temperatures to rise.⁵

Local Climate Change Impacts

The City of Nevada City, like all foothill communities in the Sierra Nevada, faces challenges associated with climate change in the region. Increased frequency and altered timing of flooding will increase risks to agriculture, people, ecosystems and infrastructure. Potential impacts on water resources include reduced mountain snowpack, delayed snow accumulation, earlier snow melting and ultimately shortages in runoff and water supply. Extended droughts may increase wildland fire risk. Since local economies in the area rely heavily on these resources for agriculture, tourism, recreation and other industries, climate change may negatively affect economic activity in Nevada City, and ultimately impact quality of life for community members.

Regulatory Context

California is a leader in developing policies to reduce GHG emissions, and these policies are some of the drivers behind the completion of GHG inventories and energy efficiency planning at the local level. The state's key efforts are described on the following page.

⁵ Based on IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

1978	<ul style="list-style-type: none"> • Title 24, Part 6. Energy Efficiency Standards first adopted in 1978. Ongoing updates. Established minimum energy efficiency performance standards for residential and nonresidential buildings. Effective July 2014 new energy efficiency construction standards cost-effectively increase efficiency by 20% for residential buildings and 25% for non-residential buildings.
2002	<ul style="list-style-type: none"> • Senate Bill 1078. Established Renewable Portfolio Standards for each of the state's investor-owned utilities (IOUs), electric service providers, and community choice aggregators to acquire 20% of their electricity from renewable resources by 2010 and 33% by 2020.
2005	<ul style="list-style-type: none"> • Executive Order S3-05. Governor's Executive Order. Set GHG reduction targets for state agencies at Year 2000 levels by 2010, 1990 levels by 2020 and 80% below 1990 levels by 2050.
2006	<ul style="list-style-type: none"> • Assembly Bill 32. Landmark legislation that requires the California Air Resources Board (ARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020.
2007	<ul style="list-style-type: none"> • Senate Bill 97. Requires lead agencies to analyze GHG emissions and climate change impacts under the California Environmental Quality Act.
2008	<ul style="list-style-type: none"> • Senate Bill 375. Requires the California Air Resources Board to establish GHG reduction targets for each Metropolitan Planning Organization (MPO) in California and directs each MPO to develop a Sustainable Communities Strategy.
2011	<ul style="list-style-type: none"> • CALGreen. Enhances sustainable construction practices through mandatory and voluntary measures including reduced construction waste, water conservation, non-toxic sealants and use of renewable materials. Now part of Title 24 and updated on same schedule.

Economic Opportunities

One of the potential outcomes of implementing the Nevada City EAP is increased investment in local green businesses and technologies which could provide new economic development opportunities for the City. The following indicators suggest a robust market for clean economy businesses and industries as we move forward to the next decade.⁶ New clean economy jobs and business opportunities range from water efficiency and recycling to energy and battery technologies as well as the transformation of existing industries. All of this creates new economic opportunities for communities within the Sierra Nevada region.

- California has more patent registrations in clean technology than any other state.
- California leads the nation in energy storage systems development and innovation.

⁶ 2014 California Green Innovation Index, 6th Edition. Next 10. www.next10.org
<http://greeninnovationindex.org/sites/greeninnovationindex.radicaldesigns.org/files/2014-Green-Innovation-Index.pdf>. p. 29, 33-44

- Jobs within California's Core Clean Economy increased by 20% in the last decade (January 2002 to 2012) while the total state economy increased 2%.
- Within California's Core Clean Economy, the service sector ranked highest (57%) followed by manufacturing (13%), installation (11%), supplier (10%) and research and development (7%).
- California's clean manufacturing jobs over the last decade were up 53%, while total state economy manufacturing fell by 21%.

Relationship to CEQA

The City of Nevada City determined the EAP was categorically exempt from the California Environmental Quality Act (CEQA) per section 15061 (b) (3) of the CEQA guidelines:

The activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

Information in the document (and related background reports) can be used in environmental assessments required for new development projects, thus expediting the project review process.

ENERGY ACTION PLAN DEVELOPMENT

Process

The path to the EAP began in 2010 when the City engaged Sierra Business Council (SBC) to conduct a GHG inventory of municipal facilities and then subsequently in 2011 to conduct a GHG inventory for the community, including residential and non-residential sectors. Energy consumption data was gathered for baseline years 2008 (municipal operations) and 2005 (community-wide, which is the recommended year due to data availability). Calculations were performed to estimate baseline emissions using the most current methodology and protocols at the time.⁷ The baseline inventories were presented to the City Council in March 2011 and March 2012.



⁷ The municipal inventory followed the Local Government Operations Protocol and the community inventory followed the International Local Government Greenhouse Gas Emissions Analysis Protocol. As part of the EAP process the City's community emissions were updated to meet the recently released United States Community Protocol, the new national standard.

In 2013 the City decided to take the information gathered through the baseline inventory process and formulate energy strategies that would assist the community in being more energy efficient now and in the future.

In 2014, the baseline inventory data was forecasted out to 2020 using local and regional growth projections. The data gathered during the inventory and forecasting process helped identify those activities within the community that consumed the most energy (and correspondingly had the highest GHG emissions). This information pointed the way to where the greatest energy efficiencies could be realized, resulting in a series of goals, strategies and actions the City can undertake to reduce energy consumption as well as dollars spent on energy. Performance indicators and targets were identified, where appropriate, to be used by the City to measure its progress toward achieving greater energy efficiency.

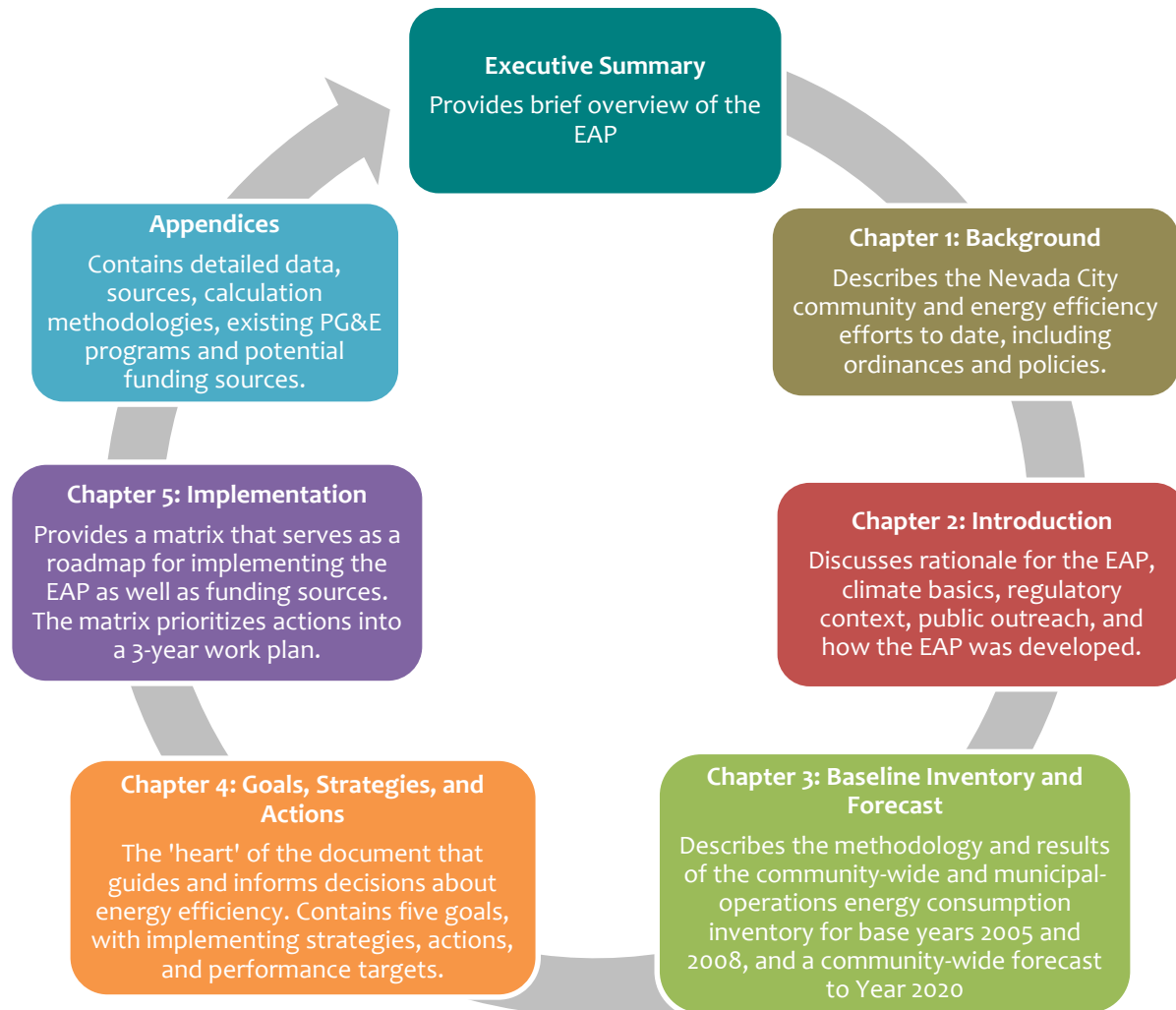
Public Outreach

As with any local planning process, community involvement is an essential part of its success. For the EAP, input was widely sought within the City to help shape its content and ensure the document is relevant and realistic. The public outreach strategy included a community study session (August 28, 2014), an online survey, information on the City's website, meeting notices in local newspapers, fliers posted in downtown, targeted outreach to local businesses and organizations, and duly noticed public meetings before the Planning Commission (April 16, 2015) and City Council (May 13, 2015).

USERS GUIDE TO THE REPORT

The EAP can be used as a tool to guide municipal and community decisions about the best ways to improve energy efficiency in the home, business, and municipal facilities and operations. It is designed as an integrated 'living' document that can be modified and augmented as new information, programs and energy efficiency technologies become available. The following diagram describes the information contained in the five chapters and appendices of the EAP. It provides a roadmap to assist the reader in accessing relevant information on existing and future energy consumption, policy direction, implementation actions, performance targets and a work plan for implementing the EAP.

Energy Action Plan Content and Organization



CHAPTER 3: BASELINE INVENTORY AND FORECAST

This chapter summarizes the 2005 baseline and 2020 forecast of community-wide energy consumption as well as the 2008 baseline of municipal-operations energy consumption. SBC previously worked with the Nevada City to conduct baseline GHG emissions inventories of the City's municipal operations and community-wide activities and sources. These inventories were conducted from 2010-2012, with support from PG&E. The baseline and forecasted energy consumption informed the strategies for reducing energy consumption and increasing energy efficiency discussed in Chapter 4. It also provides a baseline year against which future progress can be measured.

2005 Baseline Community-Wide Inventory

Nevada City's community-wide energy consumption data is expressed as aggregated residential and non-residential energy consumption by energy source. The City's municipal electricity use is included with the community-wide energy usage. Electricity and natural gas consumption were the two largest energy sources in the Nevada City built environment.

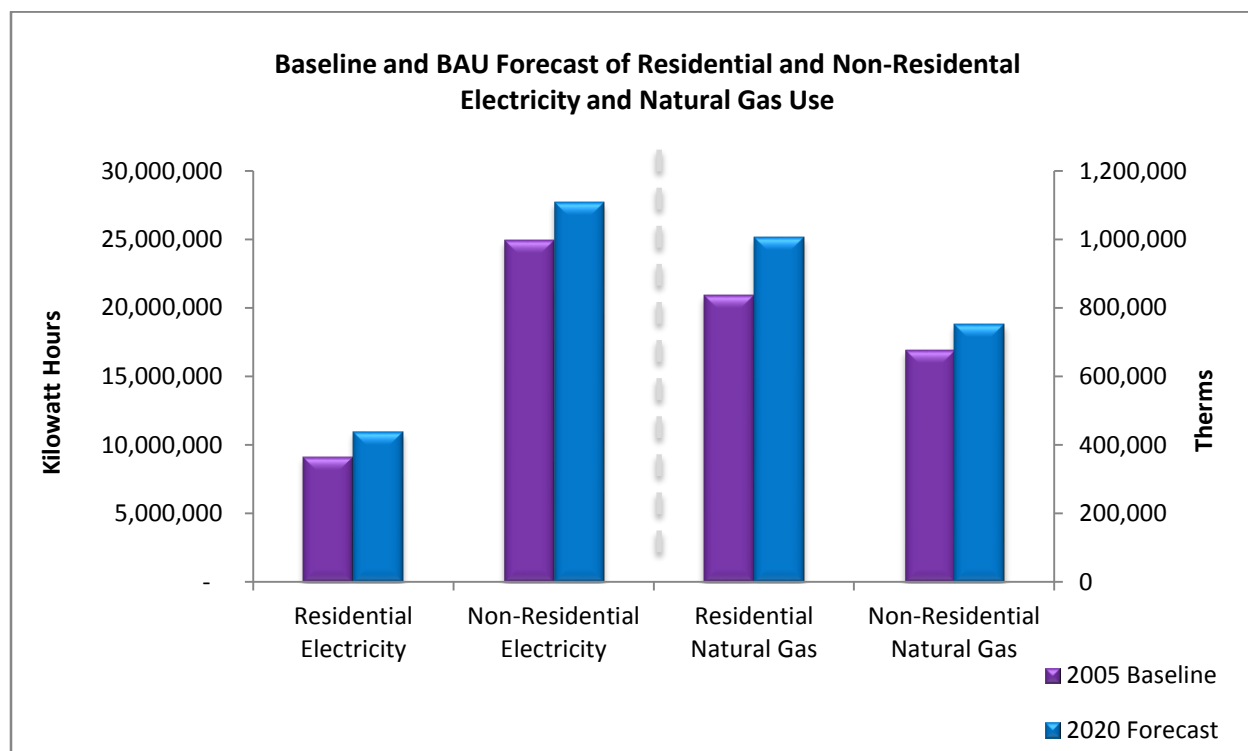
2020 Business-as-Usual Community-Wide Forecast

Nevada City's community-wide residential and non-residential energy use were forecasted out to 2020 under a business-as-usual (BAU) scenario. Since the City's municipal electricity use is included with the community-wide energy usage, a separate forecast for municipal energy was not completed. The BAU forecast scenario was completed using the Statewide Energy Efficiency Collaborative (SEEC) ClearPath California toolkit. The BAU forecast estimates how energy use would change from 2005 to 2020 in the absence of any energy efficiency or renewable energy policies or programs. The two required inputs for a forecast: baseline energy consumption data and growth rates are presented in Appendix A and B respectively. The baseline data was pulled from the community-wide GHG emissions inventory. The growth rates were calculated using local and regional projections of households and employment.

The City's residential energy use was forecasted to increase 20% by 2020 using the projected change in households in Nevada City. The annualized growth rates for households in Nevada City were calculated based on the actual change in households from 2000 to 2009, and the projected growth in new households to meet the 2009-2014 and 2014-2019 Nevada City Regional Housing Needs Assessments. (See Appendix B)

The City's non-residential energy use was forecasted to increase 11% by 2020 using the projected change in employment in Nevada County. The annualized growth rates for employment were calculated based on the actual change in employment in Nevada County from 2005 to 2010, as well as the forecast for 2020 and 2030 as reported by the California Department of Transportation in the long-term socio-economic forecast for Nevada County. (See Appendix B).

Baseline and BAU Forecast of Residential and Non-Residential Electricity and Natural Gas Use

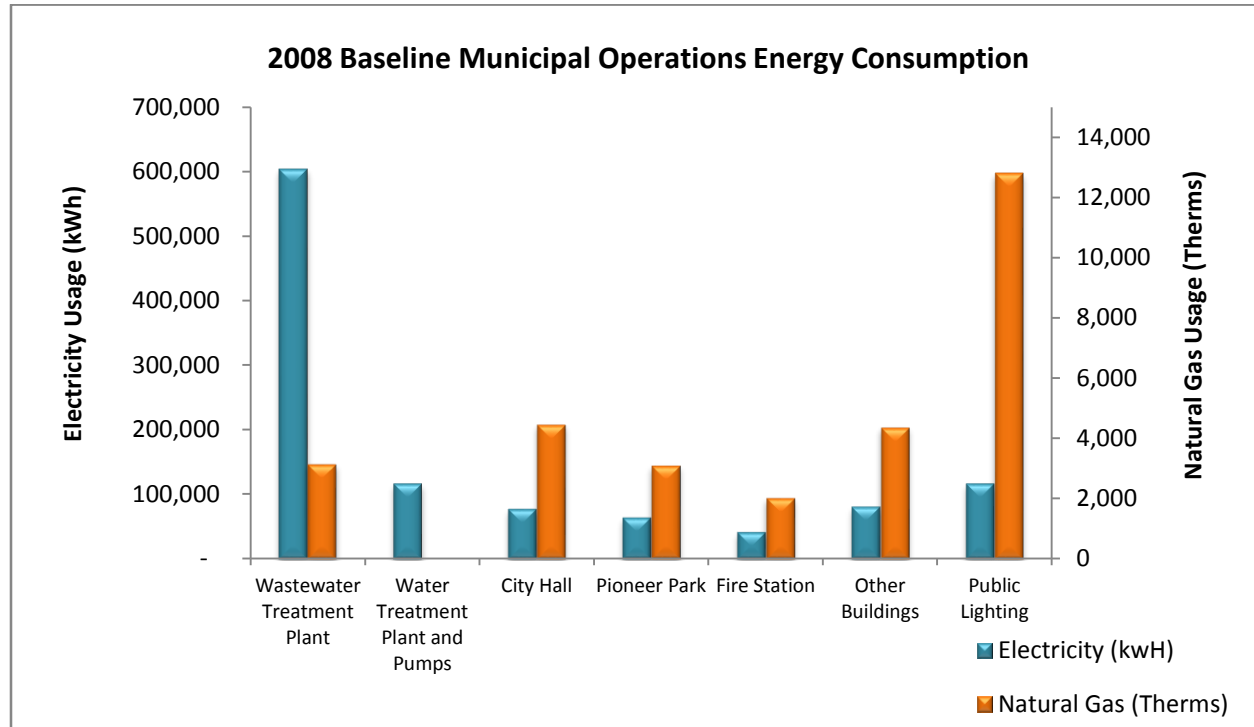


2008 Baseline Municipal Operations Inventory

Among Nevada City’s municipal operations, the Wastewater Treatment plant consumes the most amount of energy, followed by the Water Treatment Plant. A majority of Nevada City’s municipal facilities and operations consume both electricity and natural gas, with the most significant being the City Hall, Pioneer Park and the Fire Station.

The City’s total electricity consumption of 1,103,759 kWh is 3% of the community's total electricity consumption (34,028,712 kWh), and the City’s total natural gas consumption of 30,000 Therms is less than 2% of the community’s total natural gas consumption (1,510,999 Therms). Although the City has undertaken efforts to improve energy efficiency, there are still significant opportunities for the City to reduce energy usage and the associated costs. In 2008, the City spent over \$164,630 on electricity, and \$37,415 on natural gas. Detailed electricity and natural gas use is presented in Appendix A.

2008 Baseline Municipal Operations Consumption



CHAPTER 4: GOALS, STRATEGIES, AND ACTIONS

This chapter identifies goals, strategies and actions Nevada City can undertake to reduce municipal and community energy consumption, energy-related costs and energy-related GHG emissions in both the near and far term. The goals, strategies and actions pertain to the energy consumed by buildings and facilities in the residential, non-residential and municipal sectors. Other sectors, such as transportation and solid waste, are not included in this report but could be addressed in future studies.

The baseline and forecast data indicate that without a plan to reduce energy consumption, the community's energy use and associated costs will continue to increase over time. The community's residential electricity and natural gas use is forecasted to increase by 20% by 2020 and the community's non-residential electricity and natural gas use is forecasted to increase by 11% by 2020. The continued increase in non-renewable energy consumption also translates to more dollars spent on energy and additional air quality impacts within the region.

DEFINITION OF KEY TERMS

Key terms used in this report are defined below to assist in understanding the purpose of each and the interconnection between them. Definitions for some non-key terms are footnoted throughout the report at the bottom of the relevant page.

Goal

An expression of a desired outcome, an ideal future result or condition, based on community priorities and vision. Goals are not quantifiable or time-dependent but rather represent the end state.

For example: To improve public safety.

Strategy

An intermediate step between a goal and an action. Strategies define specific pathways that, if followed, will help achieve the goal.

For example: Improve lighting conditions in public spaces.

Action

Individual activities the jurisdiction will undertake to implement an energy-efficiency strategy. A strategy can have several actions.

For example: Review existing lighting conditions and install new light fixtures where required.

Performance Indicator

A quantifiable measure that is used to gauge performance in meeting identified actions.

For example: Percentage of public space reviewed for safe lighting conditions.

Target

The numerical result that demonstrates achievement of a strategy.

For example: Fifty percent (50%) of public spaces reviewed by 2020.

BASIS FOR ENERGY GOALS AND STRATEGIES

To identify the most appropriate energy-efficiency strategies for the City the following documents/resources were reviewed:

- 2005 Community-Wide GHG Emissions inventory, 2008 Government Operations GHG Emissions Inventory and forecast of future emissions (prepared by SBC in 2010 – 2012)
- Nevada City General Plan (as updated January 2014)
- Nevada City Municipal Code (as updated April 2014)
- Review of measures underway/in place in Nevada City
- Review of measures in other similar jurisdictions
- Meetings/consultation with City staff
- Public input received from community members

There are a myriad of measures and practices to reduce energy consumption and emissions. Selection of those most appropriate for Nevada City was based on the criteria below and in consultation with City staff:

- Potential of actions to reduce energy use
- Estimated cost to City to implement actions
- Estimated costs and savings for residents / business owners
- Availability of staff resources or other partner organizations to implement
- Availability of potential funding to assist with implementation
- Benefits to the community in addition to energy savings (e.g. cost savings, air-quality improvement)

ENERGY REDUCTION POTENTIAL

The energy reduction potential was calculated for applicable measures using data collected in the baseline municipal and community-wide GHG inventories and the energy use forecasts combined with the estimated energy savings associated with completion of the applicable 2020 targets. The annual energy reduction potential was calculated using top-down methods to estimate energy savings achieved in 2020 by meeting the associated 2020 targets. Calculations are documented in Appendix C.

ENERGY COSTS AND SAVINGS

For the City, the economic implications of implementing the energy efficiency and reduction measures primarily involve costs associated with staff time and potential costs associated with retaining outside consultants to assist with program implementation. Using the City's 2013-14 budget, an estimate was made of low, medium and high cost ranges that could be incurred by the City to implement the action measures in the report. The potential costs savings realized from implementation of some of the measures were not factored into this range, given the uncertainty of program design details and how they would exactly be carried out. The purpose of the cost range is to provide a relative measurement for fiscal impact to the City that will assist in prioritizing the measures for implementation. For Nevada City, the following cost ranges are used in this report:

Cost to City (annual)	Low: 0-\$3,000 Medium: \$3,001 - \$6,000 High: \$6,001+
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For residents and businesses, some reduction measures do not result in any notable private costs or savings. However, wherever possible, analysis and quantification was framed in terms of annual costs/savings (or average annual costs/savings). While there are funding sources and financing mechanisms available to offset private costs, calculations were based on a hypothetical average and did not include potential offsets. Almost all measures with private cost implications result in a return on investment in energy cost savings that will accrue over time, thus defraying some of the initial investment costs. The strategies were designed with a focus on actions with the highest return on investment.

Cost to Resident or Business (annual)	Low: \$0-\$100 Medium: \$101-\$250 High: \$251 or greater
Savings to Resident or Business (annual)	Low: \$0-\$100 Medium: \$101-\$250 High: \$251 or greater

ENERGY ACTION PLAN POTENTIAL ENERGY SAVINGS

Potential annual energy savings in 2020 were calculated for each strategy and where applicable reported for residential and non-residential energy use. Combined the strategies in the EAP can potentially reduce energy use by 10,794,804 kWh and 182,480 therms.

Summary of Potential 2020 Annual Energy Savings

Strategy Area	Strategy Title		2020 Annual Energy Savings	
			Electricity (kWh / Year)	Natural Gas (therms / Year)
Existing Structures	1.1	Expand outreach and education to increase participation in voluntary home energy-efficiency programs. Residential	822,141	75,211
	1.2	Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs. Non-Residential	2,240,443	60,779
New Construction	2.1	Improve compliance with Title 24, Part 6 – Green Building and Energy Efficiency Standards. Residential	111,684	7,050
		Non-Residential	694,696	18,103
	2.2	Provide incentives for buildings to exceed the current Title 24, Part 6 – Energy Efficiency Standards. Residential	25,788	2,502
		Non-Residential	44,902	1,235
Renewable Energy	3.1	Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use. Residential	4,220,706	0
		Non-Residential	2,122,544	0
	3.3	Encourage new development projects to meet 70% of their energy needs from renewable resources. Residential	60,171	5,837
		Non-Residential	209,541	5,763
Municipal Operations	4.1	Improve the energy efficiency of existing municipal structures.	53,113	2,807
	4.2	Evaluate the feasibility of improving energy efficiency of traffic signals and public lighting. Public Lighting	23,400	2,559
	4.3	Evaluate the feasibility of improving energy efficiency of wastewater and potable water systems.	144,239	634
Water Conservation	5.1	Encourage residents and businesses to conserve water used indoors.	11,508	
	5.2	Encourage residents and businesses to conserve water used outdoors.	9,928	
Total Potential 2020 Annual Energy Savings			10,794,804	182,480

ENERGY EFFICIENCY GOALS, STRATEGIES AND ACTIONS

The goals and strategies in this section are focused on improving the energy efficiency of existing and future buildings, reducing costs associated with energy consumption in municipal buildings and operations, and reducing the carbon intensity of the City's energy sources. The goals were designed with the California's preferred "loading order" in mind for meeting energy demand: first cost-effective energy efficiency, then cost-effective renewable energy, and finally conventional energy sources.

SUMMARY OF GOALS AND STRATEGIES

GOAL 1: INCREASE ENERGY EFFICIENCY IN EXISTING STRUCTURES

- **Strategy 1.1:** Expand outreach and education to increase participation in voluntary home energy-efficiency programs.
- **Strategy 1.2:** Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs.
- **Strategy 1.3:** Identify and promote programs that help finance energy-efficiency and renewable-energy projects.

GOAL 2: INCREASE THE ENERGY PERFORMANCE OF NEW CONSTRUCTION

- **Strategy 2.1:** Improve compliance with Title 24 Green Building and Energy Efficiency Standards.
- **Strategy 2.2:** Provide incentives for buildings to exceed the current Title-24 Energy Efficiency Standards.
- **Strategy 2.3:** Reduce the heat island effect and related summer heat gain in residential and non-residential projects.

GOAL 3: INCREASE RENEWABLE ENERGY USE

- **Strategy 3.1:** Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use.
- **Strategy 3.2:** Develop a comprehensive renewable energy program that provides outreach, financing, and technical assistance.
- **Strategy 3.3:** Encourage new development projects to meet 70% of their energy needs from renewable resources.

GOAL 4: INCREASE ENERGY EFFICIENCY IN MUNICIPAL STRUCTURES AND OPERATIONS

- **Strategy 4.1:** Improve the energy efficiency of existing municipal structures.
- **Strategy 4.2:** Evaluate the feasibility of improving the energy efficiency of public lighting.
- **Strategy 4.3:** Evaluate the feasibility of improving the energy efficiency of the potable water and wastewater infrastructure.

GOAL 5: INCREASE COMMUNITY WATER CONSERVATION AND EFFICIENCY TO REDUCE ASSOCIATED ENERGY USE

- **Strategy 5.1:** Encourage residents and businesses to conserve water used indoors.
- **Strategy 5.2:** Encourage residents and businesses to conserve water used outdoors.

GOAL 1: INCREASE ENERGY EFFICIENCY IN EXISTING STRUCTURES

Approximately 80% of the housing stock in Nevada City was built prior to the adoption of California's Title 24 energy standards in 1978 and the non-residential building stock is likely similarly dated. Improving the energy efficiency of existing buildings will save homeowners and businesses money by reducing their long-term energy costs. The City will leverage existing resources to expand education and outreach programs to promote energy efficiency in existing residential and non-residential structures.

Strategy 1.1: Expand outreach and education to increase participation in voluntary home energy-efficiency programs.

Residential energy-efficiency improvements have the potential to reduce energy bills and GHG emissions. The City will continue to partner with PG&E, Nevada County, the Energy Upgrade California alliance and other community organizations to leverage existing resources and expand public education and outreach campaigns that encourage residents to voluntarily make energy-efficiency improvements within their homes and to take advantage of the low-cost energy-efficiency financing programs described in Strategy 1.3 below. As part of the outreach program, the City will include on its website information on available energy-efficiency rebates and incentive programs. The website will also link to local case studies of homes that have implemented cost-effective, energy-efficiency improvements when available.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Continue to partner with PG&E and Project Go Inc. to activate programs for income-eligible Nevada City residents.	Short-Term (1-2 years)	Planning & Building ⁸ Departments
2	Continue to partner with PG&E, the Energy Upgrade California alliance and other community organizations to increase participation in energy efficiency rebates and incentive programs.	Short-Term (1-2 years)	Planning & Building Departments
3	Include on the City's website information on and links to residential energy-efficiency rebates, incentives, and case studies.	Short-Term (1-2 years)	City Manager's Office
PERFORMANCE INDICATOR		TARGET	
1	Percentage of households participating in energy-efficiency rebate programs.	30% participating by 2020	
2	Percentage of households achieving an improvement in building energy efficiency.	30% achieving 30% energy savings by 2020	
3	Number of households achieving an improvement in building energy efficiency	434 Existing Households	

⁸ Refers to Nevada County building department

Annual Energy Reduction Potential:

822,141 kWh
75,211 therms

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

Low to High
(depending on finance program)

Savings to Resident / Business Owner:

Low to High
(depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

Strategy 1.2: Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs.

Investments in building energy-efficiency retrofits can save considerable amounts of energy and reduce a business's operational costs. The greatest barriers to these improvements are lack of information about efficiency practices and scarcity of low-cost financing for the initial capital costs.

In partnership with PG&E, SBC and the Sierra Nevada Energy Watch program (SNEW), and local business organizations the City will provide outreach programs aimed at maximizing voluntary energy conservation within community businesses. These programs will target specific commercial sectors such as restaurants, supermarkets, retail, office, and manufacturing to provide useful energy and cost savings recommendations. The program will encourage businesses to conduct benchmarking⁹, energy audits and implement energy-efficiency projects. The City will include on its website information on energy-reduction programs specifically for commercial and industrial businesses. Case studies of businesses that implemented cost-effective, energy-efficiency improvements can be showcased on the website, focusing on those in Nevada City when possible.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Partner with PG&E and SBC to expand the SNEW program in Nevada City.	Short Term (1-2 years)	City Manager's Office
2	Provide links on the City's website to tools that demonstrate the financial benefits of efficiency upgrades to local businesses.	Short-Term (1-2 years)	City Manager's Office
3	Include on the City's website information on and links to non-residential energy-efficiency rebates, incentives, and case studies.	Short-Term (1-2 years)	City Manager's Office
PERFORMANCE INDICATOR		TARGET	
1	Number of businesses served by SNEW with energy-efficiency improvements.	186 served by 2020	
2	Percentage of businesses participating in energy-efficiency rebate programs.	30% participating by 2020	
3	Percentage of businesses achieving an improvement in building energy efficiency.	30% achieving 30% energy savings by 2020	

⁹ Energy benchmarking compares a building's energy performance against that of similar buildings.

Annual Energy Reduction Potential:

2,240,443 kWh
60,779 therms

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

Low to High
(depending on finance program)

Savings to Resident / Business Owner:

Low to High
(depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

Strategy 1.3: Identify and promote programs that help finance energy efficiency and renewable energy projects.

The up-front costs of energy efficiency improvements can be a considerable barrier for many homeowners and businesses. However there are numerous options to address this challenge, including PG&E's on-bill financing program, low interest loans, energy-efficient mortgages, and Property Assessed Clean Energy (PACE) programs. Nevada City currently has an approved PACE program.

One example, on-bill financing, works in conjunction with PG&E's energy efficiency rebate and incentive programs to eliminate upfront costs. The cost of energy-efficiency retrofits is amortized on a property's monthly energy bills. The program helps eligible customers pay for energy efficient retrofit projects with zero-interest, zero-penalty loans. Loan payments are included on the customer's monthly utility bills and are set to not exceed the energy savings (in dollars) realized from the energy-efficiency retrofit. For further information refer to this report's implementation section and appendices.

Another example, Property Assessed Clean Energy (PACE) programs are an innovative financing tool that allows residential and non-residential property owners to receive financing for energy-efficiency, clean-energy and water-efficiency projects, which they repay through a voluntary special assessment on their property tax bill. There are several organizations in California that provide cities and counties in California with access to PACE financing programs at no-cost to the local governments.

The City will partner with PG&E, community organizations and local banks to identify and promote existing and potential financing programs. The City will include links to financing programs on its website.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Partner with PG&E, community organizations and local banks to implement PACE financing and promote existing financing programs.	Short Term (1-2 years)	City Manager's Office
2	Include on the City's website descriptions of and links to existing financing programs for energy efficiency upgrades.	Short Term (1-2 years)	City Manager's Office
PERFORMANCE INDICATOR		TARGET	
1	N/A	N/A	

Annual Energy Reduction Potential:

Supports Strategy 1.1 and 1.2

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

Low to High
(depending on finance program)

Savings to Resident / Business Owner:

Low to High
(depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, Local Banks and City Funds

GOAL 2: INCREASE THE ENERGY PERFORMANCE OF NEW CONSTRUCTION

New buildings offer a significant opportunity to achieve high levels of energy efficiency through advanced materials and design. The City will work with developers and contractors to improve compliance with existing energy and green building standards and promote measures to exceed the energy standards. The City will also review the potential for incentives for buildings that exceed the Title 24 Energy Efficiency Standards.

Strategy 2.1: Improve compliance with Title 24 Green Building and Energy Efficiency Standards.

The 2013 revisions to the Title 24 Green Building (Part 11) and Energy Efficiency Standards (Part 6) help make new construction significantly more energy efficient. The Energy Standards are expected to be 25% more efficient than previous standards for residential construction and 30% more efficient for non-residential construction according to the California Energy Commission.¹⁰ The California Green Building Standards include mandatory as well as voluntary green building measures that also have energy saving benefits. Assisting developers and contractors in understanding the standards will help them achieve higher efficiencies on their projects. The energy reduction potential is based on full compliance with the standards.

The City will provide opportunities for building officials and planning department staff to attend Title 24 energy and green building trainings as well as promote trainings and educational materials to contractors and developers. EnergyCodeACE and PG&E offer free Title 24 Part 6 tools, trainings and resources to assist the building industry, related stakeholders and the public to comply with the 2013 Building Energy Efficiency Standards.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Provide opportunities for City building officials and planning department staff to attend Title 24 trainings.	Short Term (1-2 years)	Planning & Building Departments
2	Include links to Title 24 energy and green building trainings and educational resources on the City's website.	Short Term (1-2 years)	Planning & Building Departments
PERFORMANCE INDICATOR		TARGET	
1	Percentage of City staff that attended Title 24 energy and green building trainings.	100% of Planning & Building staff by 2020	
2	Percentage of New Construction complying with Title 24.	100% of New Construction by 2020	

¹⁰ http://www.energy.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html

Annual Energy Reduction Potential:

806,380 kWh
25,153 therms

Cost to City:

Low

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

High

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with
Organizations and City
Funds

Strategy 2.2: Provide incentives for buildings to exceed the current Title 24 Energy Efficiency Standards.

Providing incentives for energy-efficient buildings, such as expedited permit processing, encourages developers to explore incorporating energy-efficient building features into their projects, which can save the property owner money over the life of the building. Reduced permitting times can be an effective incentive because it can translate to significant savings for developers that are paying interest on construction or bridge loans during the permit approval process.

The City will encourage Nevada County to determine the feasibility of providing incentives or awards for buildings that exceed the current Title 24 Energy Efficiency Standards. The City will provide information to contractors and developers on available incentives and education resources related to energy efficiency and green building. The City's website will include information on available incentives and educational resources.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Encourage Nevada County to determine the feasibility of providing incentives or awards for new buildings that exceed Title 24 energy standards.	Short Term (1-2 years)	Planning & Building Departments
2	If feasible, encourage Nevada County to establish expedited permit processing for projects that exceed Title 24 energy standards by 30%.	Short Term (1-2 years)	Planning & Building Departments
3	Explore incentives that encourage applicants to exceed Title 24 energy standards. Research what other jurisdictions have implemented.	Short Term (1-2 years)	Planning & Building Departments
PERFORMANCE INDICATOR		TARGET	
1	Percentage of new residential housing units exceeding Title 24 energy standards.	15% of new buildings exceeding energy standards by 30% by 2020	
2	Percentage of new non-residential buildings exceeding Title 24 energy standards.	15% of new buildings exceeding energy standards by 15% by 2020	

Annual Energy Reduction Potential:

70,689 kWh
3,737 therms

Cost to City:

Low

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

High

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with
Organizations and City
Funds

Strategy 2.3: Reduce the heat island effect¹¹ and related summer heat gain in residential and non-residential projects.

Trees, shade structures, cool (high albedo / solar reflectance) paving and roofing materials reduce the amount of solar energy absorbed and therefore temperature of rooftops and parking lots. By increasing the use of shading and cool paving and roofing materials it is possible to reduce heat gain in residential buildings and commercial centers. This decrease in ambient air temperatures and reduced heat gain in warm summer months can reduce the amount of energy required for air conditioning.

Requirements could include a) tree standards for existing streets and parking lots; b) heat gain mitigation requirements for new parking lots (through the use of shade structures, trees or cool pavement, etc.); c) cool roofing requirements for new construction. Shade structures can also accommodate solar panels thus serving a dual purpose.

The City will develop design guidelines and municipal codes to reduce cooling loads through the use of shade trees, shade structures, cool pavement and cool roofs in new construction.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Develop landscaping ordinance to include parking lot heat-gain mitigation design guidelines. Any new design guidelines will conform to existing historic district requirements.	Near Term (3-5 years)	Planning & Building Departments
2	Require new development projects with parking lots to mitigate heat gain through the use of shade trees, shade structures with or without solar arrays, or cool pavement.	Near Term (3-5 years)	Planning & Building Departments
3	Review existing landscape ordinance to determine if changes are needed to strengthen the focus on shade trees and their energy benefits, including guidance on tree types, planting, and maintenance.	Near Term (3-5 years)	Planning & Public Works Departments
4	Promote the installation of solar shade structures by requiring new development projects outside the City's historic district with more than 80 spaces to obtain and submit a quote for solar shade structures with permit application.	Near Term (3-5 years)	Planning & Building Departments
PERFORMANCE INDICATOR		TARGET	
N/A		N/A	

¹¹ Increase in ambient air temperature due to excess heat created by non-permeable surfaces (such as roofs and pavement) being exposed to high temperatures during hot sunny days.

Annual Energy Reduction Potential:

Supports Strategies 2.1 and 2.2

Cost to City:

Medium to High

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

Medium

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

GOAL 3: INCREASE RENEWABLE ENERGY USE

Building rooftops and parking lots provide excellent opportunities for solar energy generation. In particular, non-residential and municipal facilities tend to have large, flat roofs that are well suited for solar equipment. The City will evaluate the local solar market potential and develop a comprehensive solar program that encourages the development of renewable energy. Local renewable-energy projects benefit the City's economy by creating jobs and reducing energy costs.

Strategy 3.1: Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use.

To facilitate installation of renewable energy systems, the City will evaluate the solar potential within Nevada City, taking into account design constraints in the Historic District. The City will also formulate and evaluate strategies needed to expand solar development. The City will review the existing permitting process and identify the current barriers to solar development. A streamlined permitting process using existing best practices will be developed to further promote and expedite the installation of solar systems.

The American Solar Transformation Initiative (ASTI) provides no-cost planning assistance to local governments in California to develop a Solar Roadmap for their communities. The program provides participating local governments with an assessment of local solar market potential, estimated economic and environmental impacts, assessment of current solar processes and customized solar roadmaps to accelerate solar installations.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Evaluate the residential, non-residential and municipal solar potential in the community.	Short Term (1-2 years)	Planning Department
2	Review existing permitting process and identify barriers to solar development.	Short Term (1-2 years)	Planning & Building Departments
3	Develop streamlined permitting process for solar developments.	Short Term (1-2 years)	Planning & Building Departments
PERFORMANCE INDICATOR		TARGET	
1	kWs of solar installed on residential structures.	2,379 kWs by 2020	
2	Number of homes installing solar systems	579 Households by 2020	
3	kWs of solar installed on non-residential structures.	1,197 kWs by 2020	
4	Number of non-residential structures installing solar systems	152 Non-Residential Structures by 2020	

Annual Energy Reduction Potential:

6,343,251 kWh

Cost to City:

Low to High

Cost to Resident / Business Owner:

None to High
(depending on finance program)

Savings to Resident / Business Owner:

None to High
(depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

American Solar Transformation Initiative and City Funds

Strategy 3.2: Develop a comprehensive renewable energy program that provides outreach, financing, and technical assistance.

Outreach efforts will aim to maximize community participation in renewable energy generation and emphasize energy cost savings. The program will make available, information on how home and business owners can incorporate solar hot water heaters and solar photovoltaic systems into their living and working environments. Solar water heating is a proven technology that has a short payback period, providing owners with cost savings and two to three year paybacks, when solely owner-financed.

The City will maintain a page of their website dedicated to renewable energy programs with tools available for making informed decisions on renewable energy, financing options and the permitting process. The American Solar Transformation Initiative provides participating local governments with a jurisdiction-specific public landing page for community education, including tools to evaluate the costs of solar projects and to request and compare quotes from local and regional solar vendors. The City will work with PG&E, community organizations and local banks to expand and promote available financing programs.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Partner with PG&E and community organizations to provide educational materials and tools to help owners make informed decisions about the costs and benefits of renewable energy projects.	Short Term (1-2 years)	Planning & Building Departments
2	Update the City's website with links and tools to evaluate renewable energy systems and how to request quotes from local and regional solar vendors.	Short Term (1-2 years)	City Manager's Office
3	Partner with PG&E, community organizations and local banks to expand and promote available financing options.	Short Term (1-2 years)	Planning & Building Departments
PERFORMANCE INDICATOR		TARGET	
	N/A		N/A

Annual Energy Reduction Potential:

Supports Strategy 3.1

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

None

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

American Solar Transformation Initiative and City Funds

Strategy 3.3: Encourage new development projects to meet 70% of their energy needs from renewable resources.

Solar water heating (SWH) and photovoltaic solar systems (PV) are two proven technologies that can be used to replace traditional energy use in the built environment. Commercial-scale SWH systems are designed to provide large quantities of hot water using solar energy. A typical SWH system includes roof or wall-mounted solar collectors that work with a pump, heat exchanger, and storage tanks. SWH systems can dramatically reduce the amount of natural gas or electricity used for heating water, lowering the fossil-fuel energy use associated with water heating.

Solar PV systems have reduced in cost significantly over the last decade and will often have payback periods of 8 to 15 years. Additionally, there are new financing mechanisms; such as power purchase agreements, solar leases and Property Assessed Clean Energy financing, available where property owners can receive the benefits of solar power with little to no upfront costs. The federal renewable energy tax credit provides homeowners with a tax credit for 30% of qualified expenditures. There are incentives for non-residential buildings as well. The incentives are currently set to expire on December 31, 2016.

Providing recognition or awards for projects that will meet 70% of its energy needs from renewable sources will further incentivize this program.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Encourage Nevada County to determine the feasibility of providing incentives or awards for new buildings that meet 70% of energy needs from renewable sources.	Short Term (1-2 years)	Planning & Building Departments
2	Provide information to contractors and developers on the current incentives for renewable energy developments during plan review.	Short Term (1-2 years)	Planning & Building Departments
PERFORMANCE INDICATOR		TARGET	
1	Percentage of new residential construction that meets 70% of energy needs with renewable energy.	15% of residential new construction by 2020	
2	Percentage of new non-residential construction that meets 70% of energy needs with renewable energy.	15% of non-residential new construction by 2020	

Annual Energy Reduction Potential:

269,712 kWh
11,600 therms

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

None to High
(depending on finance program)

Savings to Resident / Business Owner:

None to High
(depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, American Solar Transformation Initiative and City Funds

GOAL 4: INCREASE ENERGY EFFICIENCY IN MUNICIPAL STRUCTURES AND OPERATIONS

Measures undertaken by the City to improve energy efficiency not only reduce energy costs but also set an example for the local community and surrounding areas. The 2008 municipal operations inventory indicated that the City consumed 1,103,759 kWh of electricity in municipal buildings, water and wastewater facilities, and public lighting. The two largest consumers were wastewater treatment (55%) and buildings/facilities (24%). Additionally the City consumed 30,000 therms of Natural Gas, the majority of which was consumed by buildings/facilities (47%) and public lighting (43%). Installing Energy-Star rated equipment, lighting controls and programmable thermostats can reduce this energy use. Energy use can also be tracked by benchmarking municipal buildings with EPA's Portfolio Manager.

Strategy 4.1: Improve energy efficiency of existing municipal structures.

In 2010, the City received an Energy Efficiency Block Grant award to replace a 5-ton HVAC system, upgrade interior lighting in four buildings and install occupancy sensors. The City will establish a purchasing policy that requires new electrical equipment to be Energy Star rated (or similar energy usage rating). The City will benchmark municipal facilities using the free EPA Energy Star Portfolio Manager software to track energy use and determine the efficiency of existing facilities. The facilities with the greatest energy use or highest energy intensity will be targeted for energy audits and retro-commissioning¹² to optimize energy use and identify energy-efficiency opportunities.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Establish a purchasing requirement that all new electrical equipment be Energy Star rated when available.	Short Term (1-2 years)	City Manager's Office
2	Benchmark municipal facilities using the EPA Energy Star Portfolio Manager.	Short Term (1-2 years)	City Manager's Office
3	Conduct energy audit and retro-commissioning of municipal facilities.	Near Term (3-5 years)	City Manager's Office with SBC Guidance
PERFORMANCE INDICATOR		TARGET	
1	Purchasing policy in place.	2015	
2	Benchmark municipal facilities.	2015	
3	Audit and retro-commission municipal facilities.	2017	
4	Percentage of existing buildings energy use reduced.	20% of energy use reduced by 2020	

¹² Retro-commissioning is a systematic process to improve an existing building's energy performance and occupants comfort through a whole-building systems approach

Annual Energy Reduction Potential:

53,113 kWh
2,807 therms

Cost to City:

Low to High

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

None

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with
Organizations, Energy
Service Companies and City
Funds

Strategy 4.2: Evaluate the feasibility of improving energy efficiency of public lighting.

In 2008, the City used 117,000 kWh for street lighting spending about \$33,300 on outdoor lighting. Additionally, the City consumed 12,797 therms of natural gas for decorative streetlights spending about \$15,900. The City will determine the feasibility and evaluate the cost-effectiveness of converting street lights and other public lighting to higher efficiency lighting such as LEDs. Additionally, the City will evaluate the feasibility of improving the efficiency of the decorative natural gas lights.

PG&E offers rebates for the replacement of streetlights with LEDs and full turnkey LED replacement services to local governments.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Evaluate cost-effectiveness of upgrading the remaining street lights to energy efficient LEDs. Identify phasing and funding sources to offset costs.	Near Term (3-5 years)	Public Works Department City Manager's Office
2	Evaluate feasibility of improving the efficiency of the decorative natural gas street lights.	Near Term (3-5 years)	Public Works Department City Manager's Office
PERFORMANCE INDICATOR		TARGET	
1	Street light upgrade.	100% upgrade by 2020	
2	Percentage of public lighting energy use reduced.	20% of energy use reduced by 2020	

Annual Energy Reduction Potential:

23,400 kWh
2,559 therms

Cost to City:

Low to High

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

None

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, PG&E and City Funds

Strategy 4.3: Evaluate the feasibility of improving the energy efficiency of the potable water and wastewater infrastructure.

In 2008, the City used 116,954 kWh of electricity for potable water treatment and delivery and 604,240 kWh of electricity for wastewater treatment spending about \$15,600 on potable water and \$71,600 on wastewater. Additionally, the City consumed 3,170 therms of natural gas at the wastewater treatment plant spending about \$4,000. The City will require energy efficiency analysis in all potable water and wastewater planning documents and facility upgrades by including energy efficiency provisions in RFPs the City releases for work.

The City will also benchmark the potable water and wastewater facilities using the free EPA Energy Star Portfolio Manager software and Energy Use Assessment Tool to track energy use, conduct utility bill analysis and identify efficiency opportunities. The City will evaluate the feasibility of conducting audits of the potable water and wastewater system to identify energy efficiency improvements to pumps and treatment plants. Additionally, the City will implement a leak detection program to improve efficiency of the distribution and collection systems. The city will also evaluate the feasibility of using the biogas produced at the wastewater treatment plant to offset the natural gas or electricity usage required at the plant. PG&E offers technical assistance incentives and rebates for the installation of energy efficient equipment to local governments.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Require energy efficiency analysis in all potable water and wastewater planning documents and facility upgrades.	Short Term (1-2 years)	Public Works Department City Manager's Office
2	Benchmark potable water and wastewater treatment facilities using EPA's Portfolio Manager and Energy Use Assessment Tool.	Short Term (1-2 years)	Public Works Department City Manager's Office
3	Evaluate the feasibility of conducting energy audits and leak detection programs including the use of biogas for energy at the wastewater plant.	Near Term (3-5 years)	Public Works Department
PERFORMANCE INDICATOR		TARGET	
1	Energy Efficiency RFP Policy Complete	2016	
2	Potable water and wastewater facilities benchmarked	2016	
3	Percent of potable water and wastewater facilities energy use reduced	20% reduction in energy use by 2020	

Annual Energy Reduction Potential:

144,239 kWh
634 therms

Cost to City:

Low to High

Cost to Resident / Building Owner:

None

Savings to Resident / Building Owner:

Low

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, PG&E and City Funds

GOAL 5: INCREASE COMMUNITY WATER CONSERVATION AND EFFICIENCY TO REDUCE ASSOCIATED ENERGY USE

The state of California's official goal is to reduce per capita water use by 20% by 2020. In a typical California home the major indoor water users are toilets (33%), showers (22%), faucets (18%), washing machines (14%), and leaks (12%). Dishwashers rank last – 1%.¹³ Given that indoor water is delivered to a few, readily identifiable appliances, it is easy to target those with the greatest water conservation potential. Since it typically requires significant energy to source, treat and deliver water to community members; water conservation measures have the effect of reducing the amount of energy that the City needs to provide water.

Strategy 5.1: Encourage residents and businesses to conserve water used indoors.

The measures below focus on those most readily implementable in light of existing rebate/retrofit programs. Based on the 2013 study referenced in the footnote below, use of more water efficient toilets, showers, faucets, washing machines and leak detection could reduce water usage by 15 gallons per capita per day (GPCD), a 25% reduction from typical daily residential water usage of 62 GPCD.

The City will continue to encourage residents and businesses to voluntarily reduce their water usage. The City will work with Nevada Irrigation District (NID) and PG&E to explore the feasibility of implementing new water efficiency programs. Programs could include a toilet swap event or free low-flow showerhead giveaways.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Continue to promote existing water efficiency programs in Nevada City.	Short Term (1-2 years)	Public Works Department
2	Work with NID and PG&E to explore the feasibility of implementing new programs.	Near Term (3-5 years)	Public Works Department
3	Redesign the water bill format to encourage water conservation in residential and commercial uses	Near Term (3-5 years)	Public Works Department
PERFORMANCE INDICATOR		TARGET	
1	Percentage of households and businesses that voluntarily reduce indoor water use by 20% or more.	100% of households by 2020 ¹⁴	

¹³ California Water Plan Update, Chapter 3. Urban Water Use Efficiency. 2013. http://www.water.ca.gov/calendar/materials/vol3_urbanwue_apr_release_16033.pdf

¹⁴ Urban and agricultural water suppliers who do not meet the 20% reduction required by SB X7-7 (enacted in 2009) will not be eligible for state water grants or loans.

Annual Energy Reduction Potential:

11,508 kWh

Cost to City:

Low

Cost to Resident / Business Owner:

Low

Savings to Resident / Business Owner:

Low

Community Co-Benefits:

Reduced Water Use,
Reduced Wastewater Costs,
Reduced Energy Costs

Potential Funding Sources:

Partnerships with NID,
other Organizations and
City Funds

Strategy 5.2: Encourage residents and businesses to conserve water used outdoors.

Significant water savings can be achieved in the outdoor environment through a few readily implementable programs. The City will work with NID to evaluate the feasibility of collaborating to provide Water Wise House calls where a trained water efficiency specialist will on request visit homes, review indoor and outdoor water needs, make water efficiency recommendations and provide water saving devices or if desired, will install certain water saving devices. Additionally, the City will evaluate the feasibility of offering Water-Wise business calls where trained technicians will come to a commercial site, check for leaks, conduct outdoor irrigation check-ups and provide watering schedules.

The City will encourage or require new construction to include California Green Building Code's (CALGreen) voluntary water-efficiency measures. Expedited permit review for projects meeting the voluntary CALGreen water-efficiency measures will be examined for feasibility. Additionally, the City will install water-efficient landscaping in areas managed by the City to serve as public demonstration areas.

IMPLEMENTATION ACTION		TIME TABLE	RESPONSIBILITY
1	Review the City's existing ordinances to remove any impediments to permitting the installation and use of greywater (recycled) systems that conform to Title 24 Part 5 of the California Plumbing Code.	Short Term (1-2 years)	Planning and Building Departments
2	Work with NID to evaluate the feasibility of offering Water Wise programs and additional water efficiency rebates.	Short Term (1-2 years)	Public Works Department City Manager's Office
3	Encourage voluntary compliance with CALGreen water efficiency measures by distributing information detailing the measures to builders, contractors and realtors.	Near Term (3-5 years)	Public Works & Building Departments
4	Evaluate the feasibility of offering incentives for or requiring the voluntary water efficiency measures in CALGreen.	Near Term (3-5 years)	Planning & Building Departments
5	Design a demonstration zero-water landscape as a teaching tool for reducing outdoor water use.	Near Term (3-5 years)	Planning & Public Works Departments
PERFORMANCE INDICATOR		TARGET	
1	Percentage of households and businesses that voluntarily reduce outdoor water use by 20% or more.	100% of households by 2020	

Annual Energy Reduction Potential:

9,928 kWh

Cost to City:

Low

Cost to Resident / Business Owner:

Low

Savings to Resident / Business Owner:

Low

Community Co-Benefits:

 Reduced Water Use,
 Reduced Energy Costs

Potential Funding Sources:

 Partnerships with NID,
 other Organizations and
 City Funds

CHAPTER 5: IMPLEMENTATION

This chapter provides a roadmap for implementing the EAP. The City of Nevada City recognizes that a clear and straight-forward implementation program is essential to achieve the goals of the EAP. To successfully implement the EAP, the City, regional organizations and community members will need to work together and leverage existing and new national and state programs.

Ensuring the strategies translate from policy language into on-the-ground results is critical to the success of the EAP. To facilitate this, each strategy described in Chapter 4 contains a table that identifies the specific actions the City plans to carry out in order to achieve the identified goals. The second section of each table provides performance indicators and targets that enable staff, Council members and the public to track strategy implementation and evaluate the effectiveness of the EAP.

Evaluating the effectiveness of the EAP requires two key tasks: evaluation of the EAP as a whole and evaluation of the individual strategies. Community-wide emissions inventories provide the best indication of the overall EAP effectiveness, although it will be important to reconcile actual growth in the City versus the growth projected in the forecasts developed for the EAP. Conducting these inventories periodically, instead of annually, will allow direct comparison to the 2005/2008 baseline while lessening the impact on staff resources. It is recommended that inventories are completed at least every 5 years in order to monitor the effect of the EAP and adapt the strategies and actions to reach the identified goals.

While community-wide inventories will provide information about the EAP's overall effectiveness, it will be important to understand the effectiveness of each strategy in order to prioritize future actions. Evaluating strategy performance will require data on community participation rates and the associated energy savings. With the support of PG&E, the City will coordinate strategy evaluation on the same schedule as the community-wide inventories and summarize progress towards meeting the identified performance targets. For the EAP to remain relevant the City must be prepared to evaluate and revise the strategies and actions over time. It is likely new information, technology and programs will emerge; therefore, the City must be ready to take advantage of these opportunities. Additionally, the City will prepare interim progress reports, using a template provided by SBC, on an annual basis to track performance.

IMPLEMENTATION PROGRAM

The Implementation Program identifies specific actions and steps the City can take to achieve the specified 2020 targets. The following matrix prioritizes the actions by year based on staff resources, potential funding availability and partner organization's capacity. The matrix serves as a guidepost for Staff to initiate actions in order to implement the EAP and track progress.

EAP Implementation Matrix¹

TIME TABLE	IMPLEMENTATION ACTION	SUPPORTS	RESPONSIBILITY	INFORMATION SOURCES
2015	Partner with PG&E and regional organizations to activate existing energy efficiency and water efficiency programs	1.1.1 1.1.2 1.2.1 1.3.1 3.2.1 5.1.1 5.2.1	Planning & Building ² Departments City Manager's Office	Pacific Gas and Electric Company
	Provide information on and opportunities for staff, contractors and developers to attend training on Title 24	2.1.1 2.1.2	Planning & Building Departments	Pacific Gas and Electric Company
	Develop solar roadmap to analyze solar potential, review barriers to solar and streamline permitting	3.1.1 3.1.2 3.1.3	Planning & Building Departments	American Solar Transformation Initiative
	Adopt purchasing guidelines, benchmark municipal facilities and require energy efficiency analysis in all potable water and wastewater projects.	4.1.1 4.1.2 4.3.1 4.3.2	Public Works Department City Manager's Office	Pacific Gas and Electric Company
2016	Update the City's website with information and links to energy efficiency programs, case studies, financing programs.	1.1.3 1.2.2 1.2.3 1.3.2 2.1.2 3.3.2	Planning & Building Departments City Manager's Office	Pacific Gas and Electric Company
	Determine the feasibility of offering incentives for new construction that completes a green building checklist, including: <ul style="list-style-type: none"> Exceed Title 24 energy requirements Meet 70% of energy needs with on-site renewable energy Exceed water efficiency requirements 	2.2.1 2.2.2 2.2.3 3.3.1 5.2.2 5.2.3	Planning & Building Departments City Manager's Office	Pacific Gas and Electric Company
	Develop and adopt ordinance that explicitly permits greywater (recycled) systems	5.2.1	Planning and Building Departments	
	Partner with PG&E, Nevada County and local banks to promote and expand financing options for energy-efficiency, renewable-energy and water-efficiency projects	3.2.2 3.2.3 4.2.1	Planning, Building & Public Works Departments	Pacific Gas and Electric Company American Solar Transformation Initiative

¹ Numbering system (1.1.1) refers to Goal 1, Strategy 1, Action 1, etc.

² Refers to Nevada County building department

2017	Develop heat gain mitigation guidelines and ordinances for streets and parking lots	2.3.1 2.3.2 2.3.3 2.3.4	Planning, Building & Public Works Departments	Pacific Gas and Electric Company
	Conduct energy audits, retro-commissioning on municipal facilities. Implement cost-effective energy efficiency projects and leak detection	4.1.3 4.3.3	City Manager's Office	Pacific Gas and Electric Company
	Evaluate the cost-effectiveness of upgrading traffic signals and street lights to LED	4.2.1 4.2.2	Public Works Department City Manager's Office	Pacific Gas and Electric Company
	Work with NID to redesign the water bills to promote conservation, develop new water-efficiency programs and market programs in Nevada City including design of a zero-water demonstration garden	5.1.2 5.1.3 5.2.4 5.2.5	Planning, Building & Public Works Departments	Nevada Irrigation District

FUNDING SOURCES AND FINANCING MECHANISMS

This section describes potential funding sources and financing mechanisms that the City can pursue to offset the financial burden of implementing the EAP. Each EAP strategy is accompanied with a simplified analysis of costs and savings, potential funding sources, and partnership opportunities. The spectrum of potential public and private funding sources is ever evolving and will need to be continually evaluated. This section outlines funding options that are currently available (as of December 2014). For additional information on energy efficiency programs and financing programs refer to Appendix D and F respectively.

- U.S. Department of Energy (DOE)
- California Energy Commission (CEC)
- California Infrastructure and Economic Development Bank (IBANK)
- California Statewide Communities Development Authority (CSCDA)
- Pacific Gas and Electric Company (PG&E)

U.S. Department of Energy

The U.S. DOE provides formula grant funding and technical assistance for state and local governments to manage weatherization and clean energy programs including the Weatherization Assistance Program, State Energy Program, Energy Efficiency and Conservation Block Grant Program and American Solar Transformation Initiative.

California Energy Commission

The CEC offers low-interest loans to public institutions to finance energy-efficiency and energy generation projects on a first-come, first-serve basis. Interest rates are currently between zero and one percent. The CEC also manages the Energy Partnership Program, which provides no-cost (up to \$20,000) technical assistance to public agencies. Technical assistance includes conducting energy

audits, preparing feasibility studies, contractor assistance and design review consultation among other services. The CEC also funds Energy Upgrade California, which was designed to be Californian's one-stop-shop for home and business improvement projects that lower energy use, conserve water and natural resources. Californians can use the site to plan upgrade projects, locate participating contractors, and find rebates and incentives including up to \$6,500 towards whole house energy upgrades.

California Infrastructure and Economic Development Bank

The IBANK finances public infrastructure and private development that promotes opportunities for jobs, contributes to a strong economy and improves the quality of life in California communities. In September 2014, California IBANK launched the Clean Energy Finance Center and the Statewide Energy Efficiency Program to provide low-cost financing to State and local governments for approved energy efficiency projects. The targets will be clean energy projects such as generation, distribution, transmission and storage; energy conservation measures; environmental mitigation measures; and water treatment and distribution.

California Statewide Communities Development Authority

The CSCDA is a joint powers authority with more than 500 cities, counties and special districts as Program Participants. CSCDA provides California's local governments with an effective tool for the timely financing of community-based public benefit projects. CSCDA provides program participants with two energy financing programs. The Sustainable Energy Bond Program, which provides access to tax-exempt financing for energy efficiency projects through contracts with Energy Service Companies that contain guaranteed energy savings to cover the full cost of all retrofit work. The CaliforniaFIRST program provides local governments access to a multi-jurisdictional Property Accessed Clean Energy Program that allows property owners to secure upfront financing for energy and water-saving improvements, which they repay through a voluntary special assessment on their property tax bill. CSCDA is also in the process of developing OPEN PACE, a full turnkey resource for local governments where qualified program administrators will develop managed contractor networks within the community, provide 100% financing and file repayment obligations through the property tax bills.

Pacific Gas and Electric Company

PG&E provides technical assistance, rebates and incentives, and financing options to promote energy efficiency and renewable energy projects. For Residential customers, PG&E offers income-eligible customers monthly discounts and free energy saving improvements. PG&E also offers appliance rebates and whole-home upgrade incentives. For Non-Residential customers, PG&E offers the Energy Efficiency Financing program, which provides businesses and government agencies access to 0% loans up to \$100,000 for businesses and \$250,000 for government agencies. PG&E also offers incentives and technical assistance to improve the operational performance of facilities' equipment, lighting and control systems through a Retro-commissioning program. Additionally, PG&E offers design assistance, incentives and educational resources for new construction that exceeds Title 24 energy efficiency standard through the Savings By Design program.

APPENDIX A: NEVADA CITY BASELINE ENERGY USE

The majority of electricity in Nevada City is provided by utilities though independent energy service providers also provide a small percentage as direct access electricity. Utility electricity and natural gas consumption data was collected from Pacific Gas and Electric Company (PG&E) for all accounts within the Nevada City limits. Direct-access electricity is energy supplied by a competitive energy service provider other than a utility, but uses a utility's transmission lines to distribute the energy. Due to confidentiality laws, PG&E was unable to release direct-access electricity consumption within the Nevada City limits. The direct-access electricity consumption within Nevada City was estimated from county-level, direct-access electricity data provided by the California Energy Commission (CEC). The total direct-access electricity consumption for Nevada County was used to determine the ratio of direct-access electricity use to utility-provided electricity use for residential and non-residential energy use. This ratio was applied to the utility-provided electricity use within Nevada City to determine an estimate of the direct-access electricity consumed within Nevada City. Non-utility propane, fuel oil and wood consumption used for space and water heating was estimated using National Oceanic and Atmospheric Administration reported heating degree days for Sacramento Drainage in 2005, the number of homes using non-utility fuels for home heating reported by the U.S. Census Bureau 2005-2009 American Community Survey, and U.S. Environmental Protection Agency reported space and water heating factors. For detailed references refer to the City of Nevada City 2005 Community-Wide Greenhouse Gas Emissions Inventory.

Table A-1: Nevada City 2005 Baseline Residential Energy Use by Energy Source

Energy Source	Value	Units	Data Source
Electricity Consumption - PG&E	9,110,535	kWh	Pacific Gas and Electric Company
Electricity Consumption - Direct Access	24,369	kWh	California Energy Commission
Total Electricity Consumption	9,134,904	kWh	
Natural Gas Consumption	835,680	Therms	Pacific Gas and Electric Company
Propane (LPG) Consumption	43,870	Gallons	NOAA, U.S. EPA and U.S. Census Bureau
Wood for Home Heating Consumption	260	Cords	NOAA, U.S. EPA and U.S. Census Bureau

Table A-2: Nevada City 2005 Baseline Non-Residential Energy Use by Energy Source

Energy Source	Value	Units	Data Source
Electricity Consumption - PG&E	22,665,170	kWh	Pacific Gas and Electric Company
Electricity Consumption - Direct Access	2,228,638	kWh	California Energy Commission
Total Electricity Consumption	24,893,808	kWh	
Natural Gas - PG&E	675,319	Therms	Pacific Gas and Electric Company

Utility electricity and natural gas consumption data was collected from PG&E for all accounts paid for by the City of Nevada City.

Table A-3: Nevada City 2008 Baseline Municipal Buildings Energy Use by Energy Source

Energy Source	Electricity	Natural Gas	Data Source
Wastewater Treatment Plant	604,240 kWh	3,170 Therms	Pacific Gas and Electric Company
Water Treatment Plant and Pumps	116,954 kWh	N/A	Pacific Gas and Electric Company
City Hall	77,680 kWh	4,485 Therms	Pacific Gas and Electric Company
Pioneer Park	64,507 kWh	3,121 Therms	Pacific Gas and Electric Company
Fire Station	42,080 kWh	2,042 Therms	Pacific Gas and Electric Company
Minor Facilities Total	81,298 kWh	4,385 Therms	Pacific Gas and Electric Company
Total Municipal Buildings Energy Consumption	986,759 kWh	17,203 Therms	

Table A-4: Nevada City 2008 Baseline Public Lighting Energy Use by Energy Source

Energy Source	Electricity	Natural Gas	Data Source
Street Lights	13,666 kWh	12,797 Therms	Pacific Gas and Electric Company
Park Lighting	8,579 kWh	N/A	Pacific Gas and Electric Company
Other Outdoor Lighting	3,680 kWh	N/A	Pacific Gas and Electric Company
PG&E Owned and Operated Street Lights	91,075 kWh	N/A	Pacific Gas and Electric Company
Total Public Lighting Electricity Consumption	117,000 kWh	12,797 Therms	

APPENDIX B: NEVADA CITY BUSINESS AS USUAL ENERGY USE FORECAST

The business as usual (BAU) community-wide energy use was forecasted using the Statewide Energy Efficiency Collaborative Clear Path California forecasting tool. Municipal energy use, because it is included within the non-residential energy use, was not forecasted separately. Residential energy use was forecasted using actual and projected housing units reported by the Nevada City Regional Housing Need Assessment (RHNA) 2014-2019. Non-residential energy use was forecasted using actual growth in Nevada County jobs for 2005-2009, and the 2006-2030 Employment Forecast Projection for Nevada County prepared by the California Department of Transportation. Annualized growth rates for Nevada City housing units and employment were calculated for the Clear Path California time periods required to forecast energy use. Annualized growth rates for each time period were calculated using the standard formula.

$$\text{Annualized Growth Rate} = (X/Y)^{(1/(Z)-1)} - 1$$

Where: X = Forecast End Year Energy Use

Y = Baseline Year Energy Use

Z = Number of Years in the Forecast

Table B-1: BAU Residential Energy Use Forecast by Energy Source

Energy Source	2005 Residential Energy Use	2020 Residential Energy Use	2005-2020 Change in Energy Use
Electricity (kWh)	9,134,904	11,000,099	1,865,195
Natural Gas (Therms)	835,680	1,006,320	170,640
Propane (Gallons)	43,870	52,826	8,957
Wood (Cords)	260	313	53

Table B-2: BAU Non-Residential Energy Use Forecast by Energy Source

Energy Source	2005 Non- Residential Energy Use	2020 Non-Residential Energy Use	2005-2020 Change in Energy Use
Electricity (kWh)	24,893,808	27,705,787	2,811,979
Natural Gas (Therms)	675,319	751,620	76,301

Table B-3: Clear Path California BAU Energy Use Forecast Annualized Growth Rates

Energy Use Sector	Growth Indicator	Growth Indicator Source	Annualized Growth Rate (2005-2009)	Annualized Growth Rate (2009-2014)	Annualized Growth Rate (2014-2020)
Residential	Households	RHNA ¹	0.008268	0.017878	0.010769
Non-Residential	Employment	Caltrans ²	-0.013090	0.011586	0.017851

Table B-4: BAU Residential Energy Use Forecast Growth Indicators and Annualized Growth Rates

Year	Households	Growth Indicator Source
2000	1,313	Nevada City Regional Housing Need Assessment
2009	1,414	
2014 ³	1,545	
2019	1,630	
Time Period	Annualized Growth Rate	
2005-2009	0.008268	Nevada City Regional Housing Need Assessment
2009-2014	0.017878	
2014-2019	0.010769	

Table B-5: BAU Non-Residential Energy Use Forecast Growth Indicators and Annualized Growth Rates

Year	Employment	Growth Indicator Source
2005	29,800	Caltrans Nevada County Employment Forecast 2006-2030 Projection
2010	27,900	
2020	33,300	
Time Period	Annualized Growth Rate	
2000-2010	-0.013090	Caltrans Nevada County Employment Forecast 2006-2030 Projection
2010-2020	0.017851	

¹ RHNA: Nevada City Regional Housing Needs Assessment

² Caltrans Nevada County Economic Forecast

³ Projected

APPENDIX C: POTENTIAL ENERGY REDUCTION CALCULATIONS

This appendix shows the calculations for potential energy reductions resulting from implementation of each energy efficiency strategy. For each strategy, each step of the calculation is numbered, calculation inputs are highlighted in yellow and results are highlighted in green. Potential energy savings were not calculated for non-utility fuels because of their limited use in Nevada City and the uncertainty surrounding efficiency programs for non-utility fuels.

Strategy 1.1: Expand outreach and education to increase participation in voluntary home energy-efficiency programs.		
Target: 30% of Existing Households Reduce Energy Use 30% by 2020		
1. Baseline Year	2005	
2. Baseline Annual Residential Energy Use	9,134,904	kWh Electricity
	835,680	Therms Natural Gas
3. Baseline Number of Households	1,447	Housing Units
4. 2020 Target Percent of Households Participating	30%	of baseline homes
5. 2020 Target Percent Energy Reduction From Baseline Year	30%	of electricity use
	30%	of natural gas use
2020 Participating Households = Baseline Households x Percent Participating =	434	Housing Units
2020 Electricity Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	822,141	kWh / Year
2020 Natural Gas Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	75,211	Therms / Year

Strategy 1.2: Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs.		
Target: 30% of Existing Businesses Reduce Energy Use 30% by 2020		
1. Baseline Year	2005	
2. Baseline Annual Non-Residential Energy Use	24,893,808	kWh Electricity
	675,319	Therms Natural Gas
3. 2020 Target Percent of Non-Res Participating	30%	participating
4. 2020 Target Percent Energy Reduction From Baseline	30%	of electricity use
	30%	of natural gas use
2020 Electricity Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	2,240,443	kWh / Year
2020 Natural Gas Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	60,779	Therms / Year

Strategy 2.1: Improve compliance with Title 24 Green Building and Energy Efficiency Standards.
Target: 100% of New Construction meets Title 24 Green Building and Energy Efficiency Standards

1. Baseline Year	2005	
2. Forecast 2014-to-2020 Energy Use Increase (Without Title 24 Compliance)	Residential	
	684,741	kWh / Year Electricity
	62,640	Therms / Year Natural Gas
	Non-Residential	
	2,690,326	kWh / Year Electricity
3. Climate Zone 11 New Housing Construction (2013 CEC) ⁴	72,990	Therms / Year Natural Gas
	43.1%	Single Family
	56.9%	Multi-Family
4. Percent of Residential Energy Use Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2004 CEC) ¹	Electricity	Natural Gas
	37%	88%
5. 2008 Title 24 Energy Savings Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2008 CEC) ²	Electricity	Natural Gas
	Single Family (SF)	22.7%
	Multi-Family (MF)	19.7%
	Non-Residential (Non-Res)	4.9%
		9.4%
6. Percent of Residential Energy Use Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2010 CEC) ³	Electricity	Natural Gas
	32%	86%
7. 2013 Title 24 Energy Savings Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2013 CEC) ⁴	Electricity	Natural Gas
	Single Family (SF)	36.4%
	Multi-Family (MF)	23.3%
	Non-Residential (Non-Res)	22%
		17%
2020 Energy Savings from 2008 Title 24: Res = Forecast 2014-to-2020 Energy Use x Percent Covered Energy Use x [(Percent SF x 2008 SF Percent Savings) + (Percent MF x 2008 MF Percent Savings)] Non-Res = Forecast 2014-to-2020 Energy Use x 2008 Non-Res Percent Savings	Residential	
	53,186	kWh / Year Electricity
	4,571	Therms / Year Natural Gas
	Non-Residential	
	131,826	kWh / Year Electricity
2020 Energy Savings from 2013 Title 24: Res = (Forecast 2014-to-2020 Energy Use - 2008 Title 24 Energy Savings) x Percent Covered Energy Use x [(Percent SF x 2013 SF Percent Savings) + (Percent MF x 2013 MF Percent Savings)] Non-Res = (Forecast 2014-to-2020 Energy Use - 2008 Title 24 Energy Savings) x 2013 Non-Res Percent Savings	Residential	
	58,498	kWh / Year Electricity
	2,479	Therms / Year Natural Gas
	Non-Residential	
	562,870	kWh / Year Electricity
2020 Energy Savings from 2008 and 2013 Title 24 = 2008 Title 24 Energy Savings + 2013 Title 24 Energy Savings =	11,242	Therms / Year Natural Gas
	Residential	
	111,684	kWh / Year Electricity
	7,050	Therms / Year Natural Gas
	Non-Residential	
	694,696	kWh / Year Electricity
	18,103	Therms / Year Natural Gas

¹ 2004 CEC - http://www.energy.ca.gov/reports/400-04-009/2004-08-17_400-04-009ES.pdf
² 2008 CEC - http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.pdf
³ 2010 CEC - <http://www.energy.ca.gov/2013publications/CEC-400-2013-008/CEC-400-2013-008.pdf>
⁴ 2013 CEC - <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.pdf>

Strategy 2.2: Provide incentives for buildings to exceed the current Title 24 Energy Efficiency Standards.		
Target: 15% of New Construction Reduces Energy Use Beyond Title 24 Requirements (Residential 30% and Non-Residential 15%)		
1. Baseline Year	2005	
2. Forecast 2014-to-2020 Energy Use Increase Without Title 24 Compliance	Residential	
	684,741	kWh / Year Electricity
	62,640	Therms / Year Natural Gas
	Non-Residential	
	2,690,326	kWh / Year Electricity
	72,990	Therms / Year Natural Gas
3. 2020 Energy Savings from 2008 and 2013 Title 24 Compliance (See Strategy 2.1)	Residential	
	111,684	kWh / Year Electricity
	7,050	Therms / Year Natural Gas
	Non-Residential	
	694,696	kWh / Year Electricity
	18,103	Therms / Year Natural Gas
4. Forecast 2014-to-2020 Energy Use Increase After Title 24 Compliance	Residential	
	573,057	kWh / Year Electricity
	55,590	Therms / Year Natural Gas
	Non-Residential	
	1,995,630	kWh / Year Electricity
	54,887	Therms / Year Natural Gas
5. 2020 Target Participation	15%	Residential
	15%	Non-Residential
6. 2020 Target Energy Savings	30%	Residential
	15%	Non-Residential
2020 Energy Savings Beyond Title 24 Requirements = Forecast 2014-to-2020 Energy Use Increase After Title 24 Compliance x Percent Participation x Percent Energy Savings =	Residential	
	25,788	kWh / Year Electricity
	2,502	Therms / Year Natural Gas
	Non-Residential	
	44,902	kWh / Year Electricity
	1,235	Therms / Year Natural Gas

Strategy 3.1: Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use.
Target: 40% of Existing Households and 20% of Businesses Install Solar PV by 2020

1. Baseline Year	2005	
2. 2020 Target Potential Installations	1,447	Residential
	759	Non-Residential
3. Number of Existing Installations (2013 PG&E) ¹	370	Residential
	34	Non-Residential
4. Total Existing Installation kW (2013 PG&E)	1,521	kW Residential
	268	kW Non-Residential
5. 2020 Target Percent Participating	40%	Residential
	20%	Non-Residential
6. Average Hours of Electricity Production (2014 CSI) ²	4.86	Hours / Day
2020 Number of Participants = Potential Installations x Percent Participating =	579	Residential
	152	Non-Residential
2020 kW Solar Installed = Potential Installations x Percent Participating x Total Size of Existing Installations / Number of Existing Installations =	2,379	kW Residential
	1,197	kW Non-Residential
2020 Solar-Produced Electricity = 2020 kW Solar Installed x Average Hours per Day Production x 365 Days / Year =	4,220,706	kWh / Year Residential
	2,122,544	kWh / Year Non-Residential

Strategy 3.3: Encourage new development projects to meet 70% of their energy needs from renewable resources.
Target: 15% of New Developments Meet 70% of Energy Needs with Renewable Energy by 2020

1. Baseline Year	2005	
2. Forecast 2014-to-2020 Energy Use Increase After Title 24 Compliance (See Strategy 2.2)	Residential	
	573,057	kWh / Year Electricity
	55,590	Therms / Year Natural Gas
	Non-Residential	
	1,995,630	kWh / Year Electricity
	54,887	Therms / Year Natural Gas
3. Forecast 2014-to-2020 New Construction	103	Households
4. 2020 Target Percent Participating	15%	Residential
	15%	Non-Residential
5. 2020 Target Percent Provided by Renewables	70%	Residential
	70%	Non-Residential
2020 Non-renewable Energy Savings = Forecast Energy Use Increase After Title 24 Compliance x Percent Participating x Percent Provided by Renewables =	Residential	
	60,171	kWh / Year Electricity
	5,837	Therms / Year Natural Gas
	Non-Residential	
	209,541	kWh / Year Electricity
	5,763	Therms / Year Natural Gas

¹ 2013 PG&E – PG&E Energy Summary for Nevada City 2005 to 2013

² 2014 CSI - <http://www.csi-epbb.com/default.aspx>

Strategy 4.1: Improve the energy efficiency of existing municipal structures.		
Target: Reduce Energy Use in Municipal Buildings by 20% by 2020		
1. Baseline Year	2008	
2. Baseline Annual Municipal Buildings Energy Use	265,565	kWh Electricity
	14,033	Therms Natural Gas
3. 2020 Target Percent Energy Reduction	20%	of Electricity Use
2020 Electricity Savings = Baseline Energy Use x Percent Reduction =	53,113	kWh / Year
2020 Natural Gas Savings = Baseline Energy Use x Percent Reduction =	2,807	Therms / Year

Strategy 4.2: Evaluate the feasibility of improving energy efficiency of traffic signals and public lighting.		
Target: Reduce Energy Used by the City for Public Lighting by 20% by 2020		
1. Baseline Year	2008	
2. Baseline Annual Municipal-Operations Street Lights and Other Lighting Energy Use	117,000	kWh Electricity
	12,797	Therms Natural Gas
3. 2020 Target Percent Energy Reduction	20%	Street Lights and Other
2020 Electricity Savings = Baseline Energy Use x Percent Reduction =	23,400	kWh / Year
2020 Natural Gas Savings = Baseline Energy Use x Percent Reduction =	2,559	Therms / Year

Strategy 4.3: Evaluate the feasibility of improving energy efficiency of wastewater and potable water systems.		
Target: Reduce Energy Used by the City for Wastewater and Potable Water Treatment Systems by 20% by 2020		
1. Baseline Year	2008	
2. Baseline Annual Water/Wastewater Energy Use	721,194	kWh Electricity
	3,170	Therms Natural Gas
3. 2020 Target Percent Energy Reduction	20%	of electricity use
	20%	of natural gas use
2020 Water Systems Electricity Savings = Baseline Energy Use x Percent Reduction =	144,239	kWh / Year
2020 Water Systems Natural Gas Savings = Baseline Energy Use x Percent Reduction =	634	Therms / Year

Strategy 5.1: Encourage residents and businesses to conserve water used indoors.**Target: 100% of Households and Businesses Reduce Indoor Water Use by 20% by 2020**

1. Baseline Year	2008	
2. Baseline Population	2,947	People
3. Potable Water Energy Use (2008)	116,954	kWh / Year
4. Nevada City Population (2008)	3,055	People
5. Nevada City Potable Water Use (2008)	240,980,000	Gallons / Year
6. Percent of Urban Water Demand (2013 CA WPU) ¹	31%	Residential Indoor
	44%	Landscape Irrigation
	20%	Non-Residential
7. 2020 Target Percent Reduction in Indoor Water Use	20%	Reduction
8. Gallons Per Acre-foot Conversion	325,851	Gallons / Acre-foot
Gallons Per Capita Per Day (GPCD) = 2008 Potable Water Use / 2008 Population / 365 Days Per Year	216	Gallons /Capita / Day
2008 Potable Water Energy Use Factor = 2008 Potable Water Energy Use / 2008 Potable Water Use * Gallons Per Acre-Foot Conversion =	158	kWh / Acre-Foot
2005 Estimated Indoor Water Use = Total GPCD x (Percent Res + Percent Non-Res) =	110	Gallons / Capita / Day
2005 Estimated Annual Water Use = Indoor GPCD x Baseline Population * 365 Days Per Year / Gallons Per Acre-foot Conversion =	364	Acre-Feet / Year
2020 Reduced Indoor Water Use = Annual Water Use x Percent Reduction =	73	Acre-Feet / Year
2020 Energy Savings from Reduced Water Use = Reduced Water Use x Energy Use Factor =	11,508	kWh / Year

Strategy 5.2: Encourage residents and businesses to conserve water used outdoors.**Target: 100% of Households and Businesses Reduce Landscape Water Use by 20% by 2020**

1. Baseline Year	2005	
2. Baseline Population	2,947	People
3. Gallons Per Capita Per Day (GPCD) Water Use (See Strategy: 5.1)	216	Gallons / Capita / Day
4. Gallons Per Acre-foot Conversion	325,851	Gallons / Acre-foot
5. Percent of Urban Water Demand (2013 CA WPU)	31%	Residential Indoor
	44%	Landscape Irrigation
	20%	Non-Residential
6. 2020 Target Percent Reduction in Outdoor Water Use	20%	Reduction
7. 2008 Potable Water Energy Use Factor (See Strategy: 5.1)	158	kWh / Acre-Foot
2005 Estimated Landscaping Water Use = Total GPCD x Percent Landscape Irrigation =	95	Gallons / Capita / Day
2005 Estimated Annual Landscaping Water Use = Landscaping GPCD x Baseline Year Population * 365 Days Per Year / Gallons Per Acre-foot Conversion =	314	Acre-Feet / Year
2020 Reduced Landscaping Water Use = Annual Landscaping Water Use x Percent Reduction =	63	Acre-Feet / Year
2020 Energy Savings from Reduced Water Use = Reduced Landscaping Water Use x Energy Use Factor =	9,928	kWh / Year

¹ 2013 California Water Plan Update - http://www.waterplan.water.ca.gov/docs/cwpu2013/2013-prd/Vol3_Ch03_UrbanWUE_PubReviewDraft_Final_PDFed_co.pdf

APPENDIX D: EXISTING ENERGY EFFICIENCY PROGRAMS, POLICIES AND CODES

EXISTING PROGRAMS/POLICIES/CODES	DESCRIPTION
<i>Existing Programs</i>	
<ul style="list-style-type: none"> PACIFIC GAS & ELECTRIC COMPANY (PG&E) 	PG&E offers incentives, rebates and educational resources to residents, businesses, non-profits and government agencies in Nevada City. (http://www.pge.com/)
<ul style="list-style-type: none"> SIERRA BUSINESS COUNCIL (SBC) 	SBC administers the Sierra Nevada Energy Watch program, delivering cost effective energy-efficiency projects and benchmarking services to businesses, non-profits, and government agencies in Nevada City. SBC also offers consulting services to governments on energy and climate planning. (http://sierrabusiness.org/)
<ul style="list-style-type: none"> NEVADA CITY WATERWISE 	Nevada City WaterWise will not only help save residential water customers money but will help foster sustainability, provide conservation education, take pressure off of aging water treatment and delivery infrastructure, and ensure environmental preservation of our beloved watersheds and waterways. The WaterWise program also aims to guide residents towards the state mandated goal of 20% lower water use by the year 2020. WaterWise may also help Nevada City during the peak-use summer months when it has to buy additional water from NID, as well as stave off spending millions of dollars on infrastructure and water treatment plant renovations. WaterWise is currently offering free low-flow showerheads and a high-efficiency toilet rebate program. (http://www.nevadacityca.gov/water).
<ul style="list-style-type: none"> NEVADA CITY SUSTAINABILITY TEAM (NCST) 	NCST's mission is to create a vision for the community that values environmental quality, social equity, and economic vitality, and to develop strategies for its implementation, long-term management and economic viability. NCST developed a Policy Matrix on September 14, 2011 which extensively lists economic, community, and environmental goals and objectives. (http://nevadacityca.gov/content/sustainability-team).
<ul style="list-style-type: none"> NEVADA IRRIGATION DISTRICT (NID) 	NID offers numerous programs promoting conservation and wise use of water, such as rebates and incentives, seminars and workshops, demonstrating sustainable landscape techniques for home gardening. (http://nidwater.com/conservation/).
<ul style="list-style-type: none"> GRID ALTERNATIVES 	GRID Alternatives is a nonprofit organization that brings the benefits of solar technology to communities that would not otherwise have access, providing needed savings for families and preparing workers for jobs in the fast-growing solar industry. (http://www.gridalternatives.org/)

EXISTING PROGRAMS/POLICIES/CODES	DESCRIPTION
<ul style="list-style-type: none"> TRC ENERGY SERVICES 	<p>TRC Energy Services administers the California Advanced Homes program, which highlights best practices in energy efficiency, green building and sustainability, and offers generous financial incentives to help builders and architects create environmentally friendly, energy-efficient communities for potential home buyers. (http://cahp-pge.com/)</p>
<ul style="list-style-type: none"> PROJECT GO INC. 	<p>Project Go Inc. administers the low-income home energy assistance and weatherization assistance programs in Nevada City. (http://www.projectgoinc.org/)</p>
EXISTING POLICIES <i>(Nevada City General Plan [Housing Element current as of January 2014])</i>	
<ul style="list-style-type: none"> IV. HOUSING ELEMENT – GOALS, OBJECTIVES, POLICIES AND PROGRAMS (SECTION 6, P. 6-3) 	<p>Policy 4-1-3 – Promote energy conservation activities throughout the city</p> <p>Implementation Program 30 – The City shall refer interested parties to the various rebate programs offered by PG&E and various low income assistance programs offered by PG&E.</p> <p>Implementation Program 31 – Notify City residents that energy conservation improvements are eligible to income-based qualified households for assistance under the City’s residential rehabilitation program.</p> <p>Implementation Program 32 – With the assistance of an outside entity, incorporate new policies or programs resulting from the Energy Scarcity Resolution and/or Strategic Energy Resources Report as directed by the City Council. The amendments should address available energy saving measures into new construction projects.</p>
MUNICIPAL CODE <i>(Current as of April 2014)</i>	
<ul style="list-style-type: none"> TITLE 17 – ZONING 	<p>17.80.215 B. Outdoor lighting shall utilize energy efficient fixture/lamps.</p> <p>17.80.070 D. The landscape plan shall minimize the use of ground covers which are not drought-resistant. Wherever possible, the irrigation plan shall specify the use of drip irrigation.</p> <p>17.80.090 A. The cutting or removal of any tree is prohibited except after receiving a permit.</p>
<ul style="list-style-type: none"> TITLE 18 – ENVIRONMENT 	<p>18.01.010 – Purpose A. The native and ornamental trees in Nevada City contribute to environmental stability, quality of life, character of the City, and the value of property.</p> <p>18.01.010 – Purpose B. The city council establishes basic standards and measures for the preservation and protection of trees.</p> <p>18.01.010 – Purpose C.</p>

EXISTING PROGRAMS/POLICIES/CODES	DESCRIPTION
	<p>It shall be the policy of the city to:</p> <ol style="list-style-type: none">1. Preserve trees through its development review process;2. Require permits for cutting or removal of protected trees; and3. Require property owners to coordinate with the city to ensure optimum maintenance and health of street trees.

APPENDIX E: PG&E AND OTHER ENERGY EFFICIENCY PROGRAMS

This appendix lists programs and rebates currently offered by PG&E and other organizations, as of the publishing of the EAP. A full description of current incentives programs can be found online.

ENERGY EFFICIENCY PROGRAMS	DESCRIPTION
RESIDENTIAL PROGRAMS	
<ul style="list-style-type: none"> Home Upgrade 	PG&E's Home Upgrade program offers rebates of up to \$2,500 to help homeowners focus on their building shell to maintain a warmer or cooler indoor environment while lowering energy bills. Improvements may include attic, wall and floor insulation, duct sealing, furnace and AC replacements, and more.
<ul style="list-style-type: none"> Advanced Home Upgrade 	PG&E's Advanced Home Upgrade program offers rebates up to \$6,500 to go beyond building shell upgrades and is typically more complex, involving deep improvements. A Home Upgrade Professional will conduct a comprehensive energy assessment using energy-modeling software to create a customized energy-saving plan for your home.
<ul style="list-style-type: none"> SmartAC™ 	PG&E's SmartAC program offers the opportunity to help prevent summer energy supply emergencies from disrupting day to day activities. Upon joining, SmartAC will install their free SmartAC device. Once installed, the customer will receive a SmartAC reward check.
<ul style="list-style-type: none"> SmartRate™ 	PG&E's SmartRate program gives a discount at 3¢ per kWh on the customer's June through September monthly rate, or the equivalent of 23% off Tier 1 usage. In exchange, the customer pays a surcharge of 60¢ per kWh for 2-7PM usage between 9 and 15 PG&E SmartDays™, May through October. With SmartRate automatic bill protection, the first summer is risk free.
<ul style="list-style-type: none"> Home Appliance Rebate 	PG&E offers residential customers rebates on the purchase of Energy Star® home appliances. Rebates on cooling systems range from \$20-\$425, heating systems from \$100-\$500 and appliances from \$50-\$75.
<ul style="list-style-type: none"> Solar Water Heating 	PG&E's Solar Water Heating program provides incentives up to \$2,719 based on the expected performance of the system.
<ul style="list-style-type: none"> Federal Renewable Energy Tax Credit 	A taxpayer may claim a credit of 30% of qualified expenditures for a renewable energy system that serves a dwelling unit located in the United States that is owned and used as a residence by the taxpayer. Expenditures include labor costs for on-site preparation, assembly or original system installation, and piping or wiring to interconnect a system to the home.
<ul style="list-style-type: none"> California Advanced Homes 	California Advanced Homes™ Program, administered by PG&E and TRC Energy Services, highlights best practices in energy efficiency, green building and sustainability, and offers generous financial incentives to help builders and architects create environmentally friendly, energy-efficient communities for potential home buyers.

ENERGY EFFICIENCY PROGRAMS	DESCRIPTION
<ul style="list-style-type: none"> ▪ New Solar Homes Partnership (NSHP) 	<p>The NSHP provides financial incentives and other support to home builders, encouraging the construction of new, energy efficient solar homes that save homeowners money on their electric bills and protect the environment.</p>
TARGETED RESIDENTIAL PROGRAMS	
<ul style="list-style-type: none"> ▪ Home Energy Assistance Program (HEAP) 	<p>HEAP provides financial assistance to income-qualified applicants in the form of an annual utility credit for gas, electric, propane or firewood to help with the high costs of heating and/or cooling. HEAP programs in Nevada City are administered by Project Go Inc.</p>
<ul style="list-style-type: none"> ▪ Emergency Crisis Intervention Program (ECIP) 	<p>ECIP provides financial assistance in the event of a crisis, such as a 48-hour shut-off notice. ECIP programs in Nevada City are administered by Project Go Inc.</p>
<ul style="list-style-type: none"> ▪ Weatherization Assistance Program (WAP) 	<p>WAP provides free weatherization services and products to improve a home's energy efficiency and reduce overall utility costs, including attic insulation, weather stripping, caulking, minor home repairs and related conservation measures. WAP programs in Nevada City are administered by Project Go Inc.</p>
<ul style="list-style-type: none"> ▪ Relief for Energy Assistance through Community Help (REACH) 	<p>REACH provides grants for projects that reduce energy vulnerability such as PG&E's one-time emergency financial assistance.</p>
<ul style="list-style-type: none"> ▪ California Alternate Rates for Energy (CARE) 	<p>Qualified low-income customers that are enrolled in the CARE program receive a 30-35 percent discount on their electric and natural gas bills. CARE is administered by PG&E.</p>
<ul style="list-style-type: none"> ▪ Family Electric Rate Assistance (FERA) 	<p>The FERA program provides a monthly discount on electric bills for income-qualified households of three or more persons. FERA is administered by PG&E.</p>
<ul style="list-style-type: none"> ▪ Energy Savings Assistance Program 	<p>The Energy Savings Assistance Program provides income-qualified customers with energy-saving improvements at no charge. The program is administered by PG&E.</p>
<ul style="list-style-type: none"> ▪ Medical Baseline Allowance 	<p>Residential customers with a qualified physician certified medical condition can receive additional quantities of energy at the lowest (baseline) price. The program is administered by PG&E.</p>
<ul style="list-style-type: none"> ▪ Multi-Family 	<p>PG&E's Multi-Family Program is for property owners and managers of existing residential dwellings or mobile home parks with five or more units. The program encourages owners to install qualifying energy-efficient products in individual tenant units and common areas of residential apartments, mobile home parks and condominium complexes. A full list of available rebates and incentives is available online.</p>
<ul style="list-style-type: none"> ▪ Single Family Affordable Solar Housing (SASH) 	<p>The California Solar Initiative SASH program provides qualifying low-income homeowners up-front rebates to defray the costs of installing a solar electric system. Depending on the income level, homeowners may be eligible for an entirely free system, or a highly subsidized one. The SASH program is administered by GRID Alternatives.</p>

ENERGY EFFICIENCY PROGRAMS	DESCRIPTION
NON-RESIDENTIAL PROGRAMS	
<ul style="list-style-type: none"> Sierra Nevada Energy Watch Program (SNEW) 	<p>SNEW, administered by Sierra Business Council, delivers cost effective-energy efficiency projects to businesses, non-profits, and governments in the Sierra Nevada region including Nevada County.</p>
<ul style="list-style-type: none"> PG&E Rebates and Incentives 	<p>PG&E offers non-residential customers rebates and incentives for power management software, occupancy sensors on lights, steam traps, HVAC motors and pumps, electric water heaters, process cooling, data center airflow management, boiler economizers, refrigeration, boiler heat recovery, refrigeration control, VSD pumps, boilers and fans. A full list of current rebates can be found using the PG&E money back tool. (www.pge.com/businessrebates)</p>
<ul style="list-style-type: none"> HVAC Quality Maintenance Program 	<p>PG&E's Commercial HVAC Quality Maintenance Program offers generous incentives for enrolling in a three-year air conditioning quality maintenance service agreement and installing optional unit retrofits. The business owner will lower their operating, repair and replacement costs; optimize unit performance and efficiency; improve the indoor air quality and thermal comfort for employees and customers; help prevent HVAC unit failures that can threaten business operations; and reduce their carbon footprint.</p>
<ul style="list-style-type: none"> Lighting Rebates 	<p>PG&E offers rebates for high-efficient replacement lights as well as rebates to help cover the costs of qualifying fixtures and retrofit kits.</p>
<ul style="list-style-type: none"> Federal Business Investment Tax Credit 	<p>A taxpayer may claim an investment tax credit of 30% of qualified expenditures for solar, fuel cells, small wind systems or 10% of qualified expenditures for geothermal, microturbines and combined heat and power systems (CHP), aka co-generation systems. Expenditures include labor costs for on-site preparation, assembly or original system installation, and for piping or wiring to interconnect a system.</p>
<ul style="list-style-type: none"> Savings By Design (SBD) 	<p>SBD is a statewide program offered by PG&E to encourage high-performance new building design and construction for commercial buildings. The program offers building owners and their design teams a wide range of services, such as design assistance, design team incentives, owner incentives, and educational resources.</p>
<ul style="list-style-type: none"> Retrocommissioning (RCx) Program 	<p>Retrocommissioning (RCx) is a systematic process for identifying less-than-optimal performance in your facility's equipment, lighting and control systems and making the necessary adjustments. While retrofitting involves replacing outdated equipment, RCx focuses on improving the efficiency of what's already in place. PG&E's RCx Program provides incentives and connects businesses with experts to make sure their facilities — and the equipment and systems within them — are running in peak condition for optimal energy savings. RCx projects can improve a facility's work environment and extend the service life of equipment.</p>

APPENDIX F: ENERGY EFFICIENCY FINANCING PROGRAMS

This appendix lists available financing programs for specific sectors (community-wide, residential, non-residential, and municipal).

FUNDING SOURCE	DESCRIPTION
COMMUNITY-WIDE	
<ul style="list-style-type: none"> Property Assessed Clean Energy (PACE) 	<p>PACE is an innovative way to finance energy efficiency and renewable energy upgrades to buildings. Interested property owners evaluate measures that achieve energy savings and receive 100% financing, repaid as a property tax assessment for up to 20 years. The assessment mechanism has been used nationwide for decades to access low-cost long-term capital to finance improvements to private property that meet a public purpose. By eliminating upfront costs, providing low-cost long-term financing and making it easy for building owners to transfer repayment obligations to a new owner upon sale, PACE overcomes challenges that have hindered adoption of energy efficiency and related projects in our nation's buildings. In California PACE programs are administered by a number of entities http://www.pacenow.org/resources/all-programs/#California</p>
<ul style="list-style-type: none"> Solar Power Purchase Agreement (PPA) 	<p>A solar power purchase agreement (PPA) is a financial agreement where a developer arranges for the design, permitting, financing and installation of a solar energy system on a customer's property at little to no cost. The developer sells energy to the host customer at a fixed rate that is typically lower than the local utility's retail rate. The lower price offsets the purchase of grid electricity while the developer receives the income from these sales of electricity as well as any tax credits and other incentives generated from the system.</p>
RESIDENTIAL	
<ul style="list-style-type: none"> Energy Star Energy Efficiency Mortgages 	<p>An Energy Efficient Mortgage (EEM) is a mortgage that credits a home's energy efficiency in the mortgage itself. EEMs give borrowers the opportunity to finance cost-effective, energy-saving measures as part of a single mortgage and stretch debt-to-income qualifying ratios on loans thereby allowing borrowers to qualify for a larger loan amount and a better, more energy-efficient home. https://www.energystar.gov/index.cfm?c=mortgages.energy_efficient_mortgages</p>
<ul style="list-style-type: none"> CHF Residential Energy Retrofit Program 	<p>Through the California Home Finance Authority (CHF) Residential Energy Retrofit Program, eligible homeowners can finance energy efficiency and renewable energy measures, up to \$50,000, with a 6.5% fixed interest rate 15-year loan. http://www.chfloan.org/programs/energy/overview.shtml</p>
NON-RESIDENTIAL	
<ul style="list-style-type: none"> PG&E Energy Efficiency Financing 	<p>PG&E offers 0% interest loans of up to \$100,000. Loans can be used to replace old and inefficient equipment with no up-front out-of-pocket investment. The program allows 5 years for repayment; however, the energy savings continue to accrue after the loan is paid off. http://www.pge.com/en/mybusiness/save/rebates/onbill/index.page</p>
<ul style="list-style-type: none"> Energy Savings Agreement 	<p>An Energy Savings Agreement involves a financing contract with a private energy services company that packages energy efficiency as a service paid through the energy savings. It allows for 100% financing and is off balance sheet.</p>

FUNDING SOURCE	DESCRIPTION
<ul style="list-style-type: none"> SAFE-BIDCO 	<p>SAFE-BIDCO offers small businesses, qualifying landlords, and non-profit organizations loans up to \$450,000 for a maximum of 15 years to complete energy efficiency and renewable energy projects. The loan can cover energy studies, design and consultant fees, materials and equipment costs and loan fees.</p> <p>http://www.safe-bidco.com/loan-programs/energy-efficiency-loans/</p>
MUNICIPAL	
<ul style="list-style-type: none"> CEC Energy Efficiency Financing 	<p>The California Energy Commission (CEC) offers school districts, charter schools, county offices of education, state special schools, community college districts 0% loans for energy efficiency and energy generation projects. CEC offers cities, counties, special districts, public colleges, universities and public care institutions/hospitals 1% loans for energy efficiency and energy generation projects. http://www.energy.ca.gov/efficiency/financing/</p>
<ul style="list-style-type: none"> PG&E Energy Efficiency Financing 	<p>PG&E offers 0% interest loans of up to \$250,000. Loans can be used to replace old and inefficient equipment with no up-front out-of-pocket investment. The program allows 10 years for repayment; however, the energy savings continue to accrue after the loan is paid off.</p> <p>http://www.pge.com/en/mybusiness/save/rebates/onbill/index.page</p>
<ul style="list-style-type: none"> Energy Savings Agreement 	<p>An Energy Savings Agreement involves a financing contract with a private energy services company that packages energy efficiency as a service that is paid through the energy savings. It allows for 100% financing and is off balance sheet.</p>
<ul style="list-style-type: none"> CSCDA Sustainable Energy Bond Program 	<p>California Statewide Communities Development Authority (CSCDA) and the Foundation for Renewable Energy and Environment are teaming together to provide public agencies and nonprofit organizations throughout California with access to tax exempt financing for critical sustainable energy investments. Under the Sustainable Energy Bond Program, participating entities and organizations will contract with an Energy Service Company (ESCO) to complete energy and water conservation measures. Improvements could include street lighting, building lighting, pumps, HVAC, system controls, boilers, chillers, ducting, windows, partial roofing, toilets and others. The program participants will receive substantial utility cost savings, including a contractual guarantee sufficient to cover the full cost of all retrofit work. All projects are financed through tax exempt bonds.</p> <p>http://www.cacommunities.org/energy-finance-programs/</p>
<ul style="list-style-type: none"> IBank Clean Energy Finance Center 	<p>The California Infrastructure and Economic Development Bank (IBank) Clean Energy Finance Center (CEFC) encourages concerted public and private investments and utilizes IBank's access to capital markets for selected clean energy and energy efficiency projects. The IBank CEFC will help to drive energy related projects for State and local governments.</p> <p>http://ibank.ca.gov/clean_energy.htm</p>

APPENDIX G: PUBLIC OUTREACH

Throughout development of the Energy Action Plan (EAP) public outreach was a key part of the process. This effort involved a publicly noticed study session (August 28, 2014), an on-line survey and information on the City's website. In addition there were two public hearings – one before the Planning Commission on April 16, 2015 and one before the City Council on May 13, 2015. The Council approved the EAP unanimously (5-0) on May 13, 2015. A variety of methods were used to 'spread the word' about the study session including newsprint articles, radio announcements, multiple email blasts to local contacts, and invitations to electeds, the Chamber and other local organizations and businesses. A summary of public input from the study session and on-line survey is described below.

Study Session: August 28, 2014

The study session summarized work performed by Sierra Business Council (SBC) for Nevada City in 2010 – 2014. The work included an inventory of energy used community-wide and by municipal operations for base years 2005 and 2008, and a forecast of future usage to Year 2020. A series of charts and graphic displays were provided as well as handout materials summarizing the work done to date.

While turnout was low a number of excellent comments were made that helped inform the next phase of the process – development of the goals, strategies and actions. A summary of the key comments is provided below.

Comments from Study Session: August 28, 2014

Topic	Comment
Rebate/ Incentive Programs	Energy Star – <i>community has participated</i>
	Solar Rebate – <i>community has participated</i>
	Smart Energy Line
	Time of Use incentives
	Window Replacement – <i>community has participated</i>
Program Participation	Cost savings (+)
	Already off grid (-)
	Lack of awareness (-)
	Responsible Citizen (+)
	Selling soon (-)
	Upfront costs (-)
	Declining home values (-)
	Involved in process / takes lots of time (-)
	Oversized solar (-) – <i>community does not want</i>
	NOTE: (-) = detractor; (+) = incentive;
Program Improvements	Incentives for renters
	Incentives for landlords
	Lack of return on investments if selling home
	Incentives for senior home owners
	Education of loading order
	General awareness

Topic	Comment
	Lengthen time period for rebate programs
	Make signing up easier / simplify application process
	Awareness of different kinds of solar – small solar
Best Ways to Reduce Energy Use	Target specific areas for programs; ripple effect
	Tax incentives or rebates for non-residential (business)
	Large scale solar
	Change out city's street lights to LED, but not so bright
	Pamphlets / brochures at city hall
	Incentivize lighting in homes
	Promote light switch outs as a way to reduce cooling costs
	Obtain resolutions from cities to partner with PG&E or commit to greater energy efficiency
	LG's advocate for more rebate programs – a unified voice
	Tip of the month in local news media
	Quarterly city news letter
	Toilet swap out program in the H2o bill

Online Survey

To garner additional input from Nevada City residents on the strategies contained in the Energy Action Plan, Sierra Business Council designed and distributed an on-line survey. The survey was sent to SBC's contact list for Nevada City, shared on Facebook (with a target towards Nevada City), local public officials, and current/past SBC Sierra Nevada Energy Watch customers. The response was good and overall indicated strong support for forwarding energy efficiency strategies throughout the community. A summary is provided on the following page.

Online Survey Summary for Nevada City
Activated March 30, 2015; Closed May 6, 2015

Respondent Profile: <ul style="list-style-type: none"> ▪ 78 total responses ▪ 78% from Nevada City ▪ 91% were 45 or older ▪ 61% were 55 or older 	
Survey Questions	Responses
Promote energy efficiency	89% yes
Are proposed strategies effective	75% yes
Offer incentives for projects exceeding Title 24 energy requirements	68% yes
Offer incentives for renewable energy projects	68% yes
Prioritize municipal energy efficiency and renewable energy projects	79% yes City should prioritize. Focus should be: <ul style="list-style-type: none"> ▪ Solar ▪ Lighting ▪ Building insulation
Promote water conservation	90% yes
Offer incentives for projects exceeding Title 24 water efficiency requirements	64% yes
Obtaining information to make a decision about an energy efficiency project in home/business	Top two ways: <ul style="list-style-type: none"> ▪ Average costs ▪ Contractor quotes
Accessing information about energy efficiency programs, rebates, etc.	Top three sources: <ul style="list-style-type: none"> ▪ City website ▪ Seminars/Workshops ▪ Energy Upgrade California
Additional Comments (partial list)	<ul style="list-style-type: none"> ▪ Pursue but don't require the strategies ▪ Educate residents about energy efficiency and its benefits ▪ Incentives work ▪ Focus on energy efficiency measures first, then solar ▪ City can set example/lead the way to energy efficiency ▪ Questions seem redundant ▪ Provide additional information to help residents in deciding to incorporate energy efficiency measures (input from PG&E, subsidies, payback, etc.)